LINKSYS®
A Division of Cisco

USER GUIDE

BUSINESS SERIES

10/100 4-Port VPN Router

Model: RV042

About This Guide

Icon Descriptions

While reading through the User Guide you may see various icons that call attention to specific items. Below is a description of these icons:

NOTE: This check mark indicates that there is a note of interest and is something that you should pay special attention to while using the product.

WARNING: This exclamation point indicates that there is a caution or warning and it is something that could damage your property or product.

WEB: This globe icon indicates a noteworthy website address or e-mail address.

Online Resources

Website addresses in this document are listed without **http://** in front of the address because most current web browsers do not require it. If you use an older web browser, you may have to add **http://** in front of the web address.

Resource	Website
Linksys	www.linksys.com
Linksys International	www.linksys.com/international
Glossary	www.linksys.com/glossary
Network Security	www.linksys.com/security

Copyright and Trademarks

Chapter 1: Introduction

Introduction to the Router

Thank you for choosing the Linksys 10/100 4-Port VPN Router. The Router lets multiple computers in your office share an Internet connection. The dual Internet ports let you connect a second Internet line as a backup, or you can use both Internet ports at the same time, allowing the Router to manage bandwidth demands for maximum efficiency.

The Router features a built-in, 4-port, full-duplex, 10/100 Ethernet switch to connect four computers directly, or you can connect more switches to expand your network. For remote connections, up to 50 remote office or traveling users can securely connect to your office network using the Router's Virtual Private Network (VPN) capability.

Use the browser-based utility to configure settings and run convenient wizards that will help you set up the Router and its access rules.

Introduction to VPNs

A VPN is a connection between two endpoints—a VPN Router, for instance—in different networks that allows private data to be sent securely over a shared or public network, such as the Internet. This establishes a private network that can send data securely between these two locations or networks.

The private network is established by creating a "tunnel". A VPN tunnel connects the two computers or networks and allows data to be transmitted over the Internet as if it were still within those networks. A VPN tunnel uses industry-standard encryption and authentication techniques to secure the data sent between the two networks.

Virtual Private Networking was created as a cost-effective alternative to using a private, dedicated, leased line for a private network. It can be used to create secure networks linking a central office with branch offices, telecommuters, and/or professionals on the road.

There are two basic ways to create a VPN connection:

- VPN Router to VPN Router
- computer (using VPN client software) to VPN Router

The VPN Router creates a "tunnel" or channel between two endpoints, so that data transmissions between them are secure. A computer with VPN client software can be one of the two endpoints.

For an IPSec VPN tunnel, the VPN Router and any computer with the built-in IPSec Security Manager (Windows 2000 and XP) can create a VPN tunnel using IPSec (Windows Vista uses a similar utility). Other Windows operating systems require additional, third-party VPN client software applications that support IPSec to be installed.

✓ **NOTE:** The 10/100 4-Port VPN Router supports IPSec VPN client software, including the Linksys QuickVPN software. (For more information, refer to "Appendix B: Linksys QuickVPN for Windows 2000, XP, or Vista".)

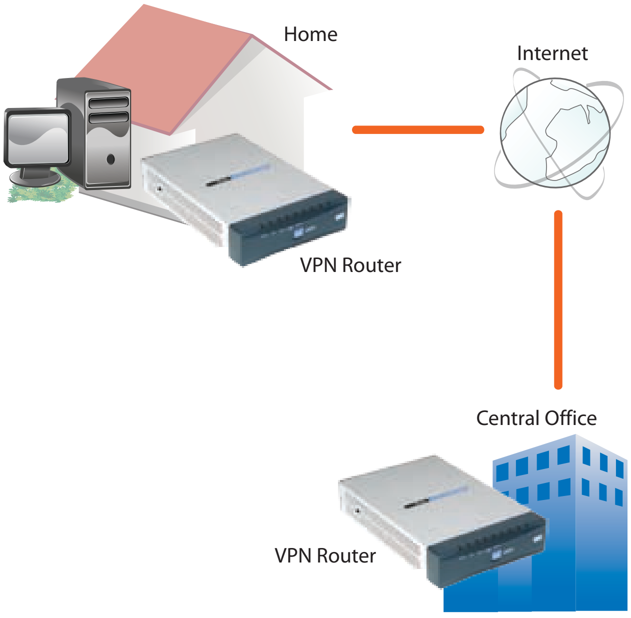
For a PPTP VPN tunnel, the 10/100 4-Port VPN Router and any computer running Windows 2000 or XP can create a VPN tunnel using PPTP.

VPN Examples

The following are examples of a VPN tunnel between two VPN routers and a VPN tunnel between a computer using VPN client software and a VPN router.

VPN Router to VPN Router

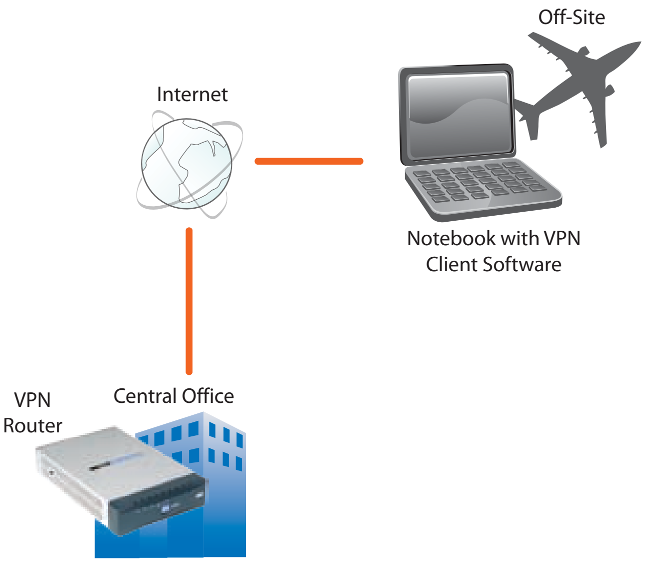
For example, at home, a telecommuter uses his VPN Router for his always-on Internet connection. His Router is configured with his office's VPN settings. When he connects to his office's router, the two routers create a VPN tunnel, encrypting and decrypting data. As VPNs use the Internet, distance is not a factor. Using the VPN, the telecommuter now has a secure connection to the central office's network, as if he were physically connected.



VPN Router to VPN Router

Computer (using VPN client software) to VPN Router

The following is an example of a computer-to-VPN Router VPN. In her hotel room, a traveling businesswoman connects to her Internet Service Provider (ISP). Her notebook computer has VPN client software that is configured with her office's VPN settings. She accesses the VPN client software and connects to the VPN Router at the central office. As VPNs use the Internet, distance is not a factor. Using the VPN, the businesswoman now has a secure connection to the central office's network, as if she were physically connected.

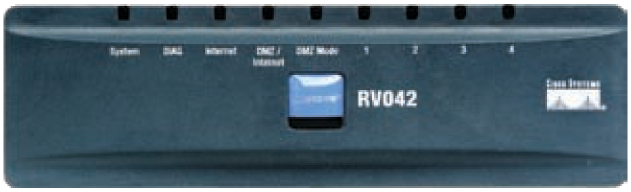


Computer to VPN Router

For additional information and instructions about creating your own VPN, visit the Linksys website at www.linksys.com.

Chapter 2: Product Overview

Front Panel



🟥 **Diag** (Red) The Diag LED lights up when the Router is not ready for use. It turns off when the Router is ready for use.

🟩 **System** (Green) The System LED lights up when the Router is powered on. It flashes when the Router is running a diagnostic test.

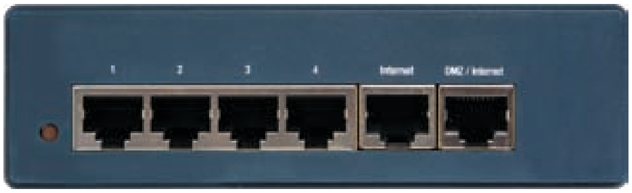
🟩 **Internet** (Green) The Internet LED lights up when the Router is connected to a cable or DSL modem through the Internet (WAN1) port.

🟩 **DMZ/Internet** (Green) The DMZ/Internet LED lights up when the Router is actively connected through the DMZ/Internet (WAN2) port.

🟩 **DMZ Mode** (Green) The DMZ Mode LED lights up when the Router is using DMZ mode.

🟩 **1, 2, 3, 4 (LAN)** (Green) These numbered LEDs, corresponding with the numbered ports on the Router's back panel, serve two purposes. The LED is solidly lit when the Router is connected to a device through that port. The LED flashes to indicate network activity over that port.

Back Panel



● **Reset** The Reset button can be used for a warm reset or a reset to factory defaults.

- **Warm Reset** If the Router is having problems connecting to the Internet, press and hold in the Reset button for a second using the tip of a pen. This is similar to pressing the power button on your computer to reboot it.
- **Reset to Factory Defaults** If you are experiencing extreme problems with the Router and have tried all other troubleshooting measures, press and hold in the Reset button for 30 seconds. This will restore the factory defaults and clear all of the Router's custom settings.

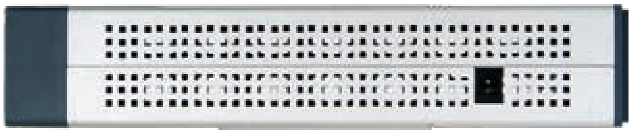
  You can also reset the Router to factory defaults using the *System Management > Factory Default* screen of the Router's web-based utility.

1, 2, 3, 4 (LAN) These Ethernet ports connect the Router to wired computers and other Ethernet network devices.

Internet (WAN1) This port connects to a cable or DSL modem.

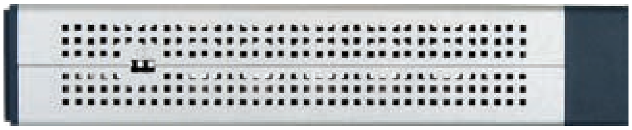
DMZ/Internet (WAN2) This port can be used in one of two ways, a second Internet port or DMZ port. When used as an additional Internet port, it connects to a cable or DSL modem. When used as a DMZ port, it connects to a switch or public server.

Right Side Panel



Power The Power port connects to the AC power adapter.

Left Side Panel



Security Slot You can attach a lock to the security slot so the Router will be protected from theft.

Chapter 3: Installation

Physical Installation

There are two ways to place the Router. The first way is to place the Router horizontally on a surface. The second way is to mount the Router on a wall.

Horizontal Placement

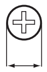
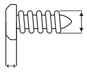
The Router has four rubber feet on its bottom panel. Set the Router on a flat surface near an electrical outlet.

WARNING: Do not place excessive weight on top of the Router; too much weight could damage it.

Wall-Mounting Placement

The Router has two wall-mount slots on its bottom panel. The distance between the two slots is 57 mm (2.24 inches).

Two screws are needed to mount the Router.

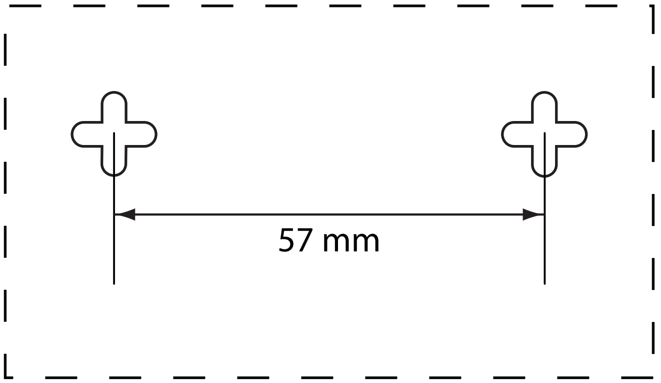
Suggested Mounting Hardware	
 4.5-5 mm	 1.5-1.8 mm 2.5-2.9 mm

†Note: Mounting hardware illustrations are not true to scale.

NOTE: Linksys is not responsible for damages incurred by insecure wall-mounting hardware.

Follow these instructions:

1. Determine where you want to mount the Router. Make sure that the wall you use is smooth, flat, dry, and sturdy. Also make sure the location is within reach of an electrical outlet.
2. Drill two holes into the wall. Make sure the holes are 57 mm (2.24 inches) apart.
3. Insert a screw into each hole and leave 2 mm (0.8 inches) below the head exposed.
4. Maneuver the Router so two of the wall-mount slots line up with the two screws.
5. Place the wall-mount slots over the screws and slide the Router down until the screws fit snugly into the wall-mount slots.



Print this page at 100% size. Cut along the dotted line, and place on the wall to drill precise spacing.

Wall Mounting Template

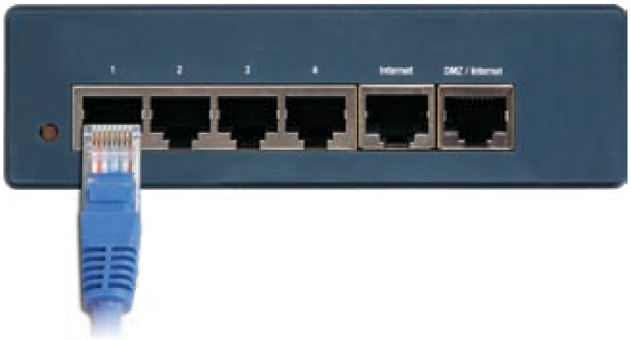
Cable Connections

To connect network devices to the Router, follow these instructions:

1. Before you begin, make sure that all of your hardware is powered off, including the Router, computers, switches, and cable or DSL modem.

2. Connect one end of an Ethernet network cable to one of the numbered ports on the back of the Router. Connect the other end to an Ethernet port on a network device, such as a computer or switch.

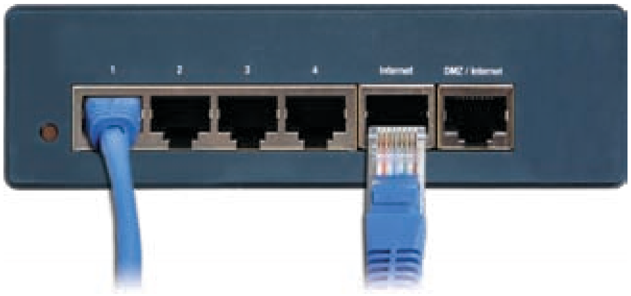
   Repeat this step to connect more computers or other network devices to the Router.



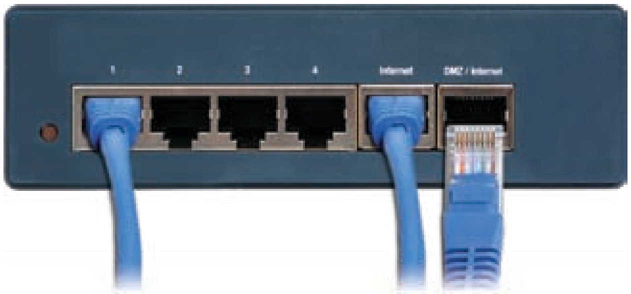
Connect to Port 1

3. Connect your cable or DSL modem's Ethernet cable to the Router's Internet port.

   If you are using the DMZ/Internet port, then connect an Ethernet cable to the DMZ/Internet port. Connect the other end to a network device, such as a modem or public server.



Connect to the Internet Port



Connect to the DMZ/Internet Port

4. Power on the cable or DSL modem. If you have a network device connected to the DMZ/Internet port, power on the network device.

5. Connect the included power adapter to the Router's Power port, and then plug the power adapter into an electrical outlet.

Connect the Power

6. The System LED on the front panel will light up as soon as the power adapter is connected properly.

7. Power on your computers and other network devices.

Chapter 4: Advanced Configuration

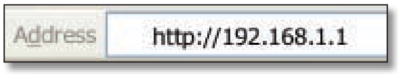
Overview

The Router's web-based utility allows you to set up the Router and perform advanced configuration and troubleshooting. This chapter will explain all of the functions in this utility.

These are the main tabs of the utility: System Summary, Setup, DHCP, System Management, Port Management, Firewall, VPN, Log, Wizard, Support, and Logout. Additional tabs will be available after you click one of the main tabs.

How to Access the Web-Based Utility

1. For local access of the Router's web-based utility, launch your web browser, and enter the Router's default IP address, **192.168.1.1**, in the *Address* field. Press the **Enter** key.

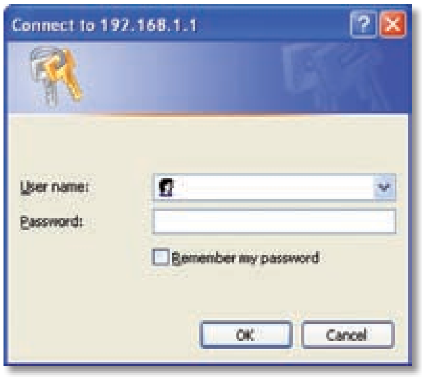


Address http://192.168.1.1

Address Bar

NOTE: If the Remote Management feature on the *Firewall* > *General* screen has been enabled, then users with administrative privileges can remotely access the web-based utility. Use **http://<WAN IP address of the Router>**, or use **https://<WAN IP address of the Router>** if you have enabled the HTTPS feature.

2. A login screen prompts you for your User name and Password. Enter **admin** in the *User name* field, and enter **admin** in the *Password* field. (You can change the Password on the *Setup* > *Password* screen.) Then click **OK**.



Connect to 192.168.1.1

User name:

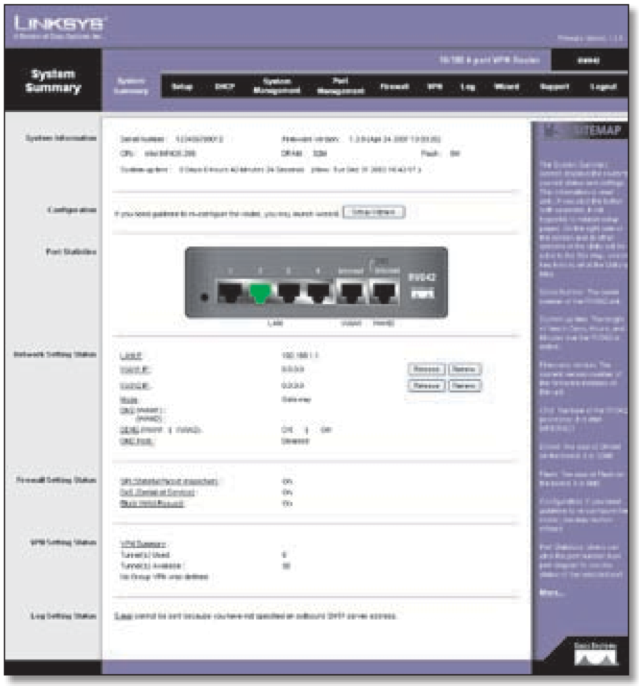
Password:

□ Remember my password

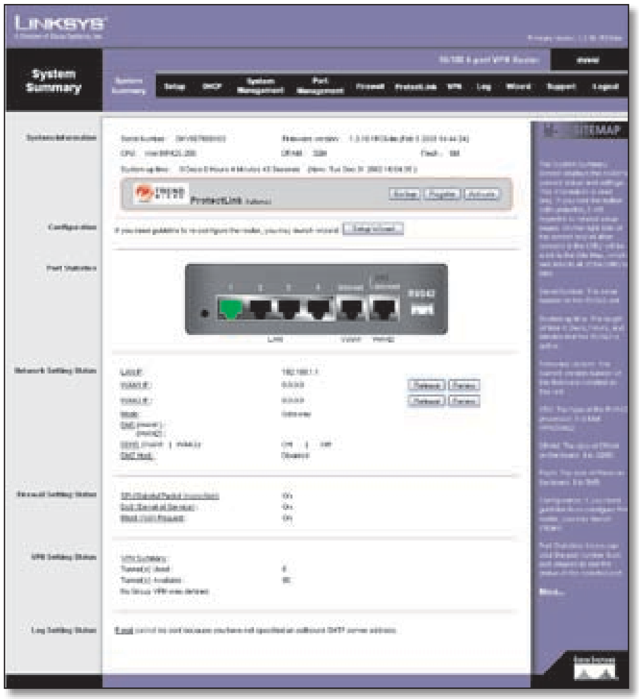
Login Screen

System Summary

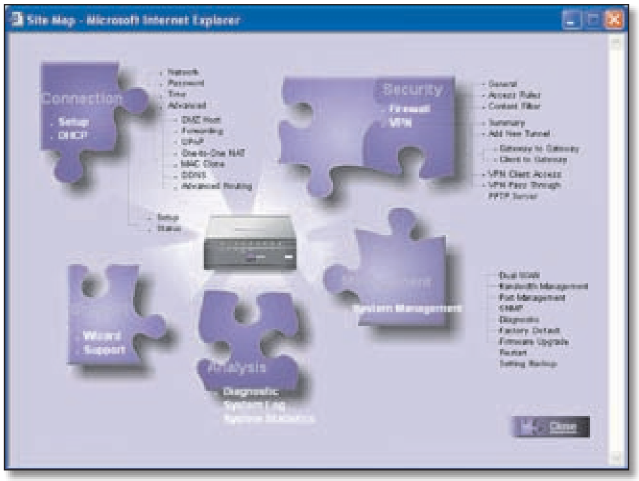
The first screen that appears is the *System Summary* screen, which displays the Router's current status and settings. This information is read-only. Underlined text is hyperlinked to related setup pages, so if you click a hyperlink, the related setup screen will appear. On the right-hand side of this screen and all other screens of the utility is a link to the Site Map, which has links to all of the utility's tabs. Click **Site Map** to view the Site Map. Then, click the desired tab.



System Summary



System Summary (ProtectLink™ Available)



Site Map

System Information

Serial Number Displayed here is the serial number of the Router.

Firmware version Displayed here is the current version number of the firmware installed on the Router.

CPU Displayed here are the type and speed of the processor installed on the Router.

DRAM Displayed here is the size of DRAM installed on the Router's motherboard.

Flash Displayed here is the size of flash memory installed on the Router's board.

System Up Time This is the length of time in days, hours, and minutes that the Router has been active. The current time and date are also displayed.

Trend Micro™ ProtectLink Gateway

The optional Trend Micro ProtectLink Gateway service provides security for your network. It checks e-mail messages, filters website addresses (URLs), and blocks potentially malicious websites.

> ✓ **NOTE:** If the Trend Micro ProtectLink Gateway options are not displayed on the *System Summary* screen, you can upgrade the Router's firmware if you want to purchase and use this optional service. Refer to "Appendix F: Firmware Upgrade" for instructions.

Go buy To purchase a license to use this service, click **Go buy**. You will be redirected to a list of Linksys resellers on the Linksys website. Then follow the on-screen instructions.

Register If you already have a license, click **Register**. You will be redirected to the Trend Micro ProtectLink Gateway website. Then follow the on-screen instructions.

> ✓ **NOTE:** To have your e-mail checked, you will need to provide the domain name and IP address of your e-mail server. If you do not know this information, contact your Internet Service Provider (ISP).

Activate If you have registered, click **Activate**. You will be redirected to the Trend Micro ProtectLink Gateway website. Follow the on-screen instructions.

For more information, refer to "Appendix G: Trend Micro ProtectLink Gateway Service."

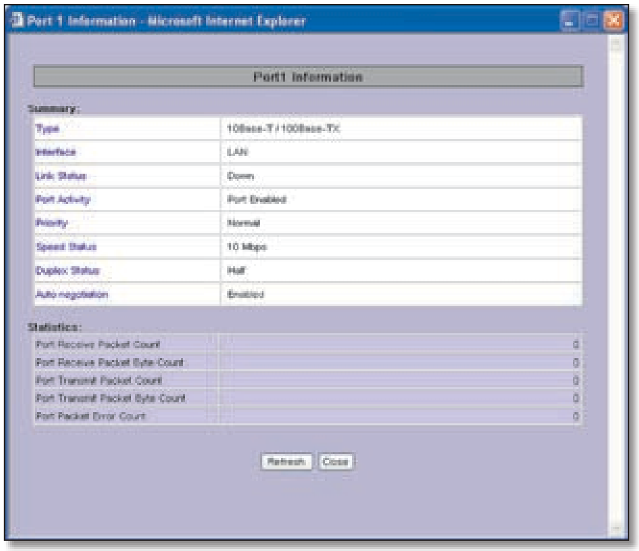
Configuration

If you need help to configure the Router, click **Setup Wizard**, and follow the on-screen instructions. For additional information, refer to the "Wizard" section of this chapter.

Port Statistics

The image of the Router's back panel displays the status of each port. If a port is disabled, it will be red; if a port is enabled, it will be black. If a port is connected, it will be green. Click any port to view the port's Summary table in a separate window.

The Summary table shows the settings of the selected port, including Type, Interface, Link Status, Port Activity, Priority, Speed Status, Duplex Status, and Auto negotiation.



Port 1 Information - Microsoft Internet Explorer

Port1 Information

Summary:

Type	10Base-T / 100Base-TX
Interface	LAN
Link Status	Down
Port Activity	Port Enabled
Priority	Normal
Speed Status	10 Mbps
Duplex Status	Half
Auto negotiation	Enabled

Statistics:

Port Receive Packet Count	0
Port Receive Packet Byte Count	0
Port Transmit Packet Count	0
Port Transmit Packet Byte Count	0
Port Packet Error Count	0

Port 1 Information

For the selected port, the statistics table shows this information: number of packets received, number of packet bytes received, number of packets transmitted, number of packet bytes transmitted, and number of packet errors.

To update the on-screen information, click **Refresh**. To exit this screen, click **Close**.

Network Setting Status

LAN IP It shows the current LAN IP address of the Router, as seen by internal users on the network, and it hyperlinks to the LAN Setting section on the *Network* screen of the Setup tab.

WAN1 IP This shows the current WAN1 IP address of the Router, as seen by external users on the Internet and hyperlinks to the WAN Connection Type settings on the *Setup* > *Network* screen. If the port is set to Obtain an IP automatically, two buttons, Release and Renew, will be available. Click **Release** to release the IP address, and click **Renew** to update the DHCP Lease Time or get a new IP address. If the WAN port is set to PPPoE or PPTP, two buttons, Connect and Disconnect, will be available.

WAN2/DMZ IP This shows the current WAN2 IP address of the Router, or DMZ IP address when DMZ is selected, as seen by external users on the Internet and hyperlinks to the WAN Connection Type settings on the *Setup* > *Network* screen.

Mode It shows the Router's Working Mode (Gateway or Router), and it hyperlinks to the Dynamic Routing section on the *Setup* > *Advanced Routing* screen.

DNS It shows all DNS server IP addresses and hyperlinks to the WAN Connection Type settings on the *Setup* > *Network* screen.

DDNS It shows the DDNS settings of the Router's WAN port(s) and hyperlinks to the *Setup* > *DDNS* screen.

DMZ Host It shows the DMZ private IP address and hyperlinks to the *Setup* > *DMZ Host* screen. The default is **Disabled**.

Firewall Setting Status

SPI (Stateful Packet Inspection) It shows the status (On/Off) of the SPI setting and hyperlinks to the *Firewall* > *General* screen.

DoS (Denial of Service) It shows the status (On/Off) of the DoS setting and hyperlinks to the *Firewall* > *General* screen.

Block WAN Request It shows the status (On/Off) of the Block WAN Request setting and hyperlinks to the *Firewall* > *General* screen.

VPN Setting Status

VPN Summary It hyperlinks to the *VPN* > *Summary* screen.

Tunnel(s) Used It shows the number of VPN tunnels used.

Tunnel(s) Available It shows the number of VPN tunnels available.

Current Connected (The Group Name of GroupVPN1) users It shows the number of users. (If the GroupVPN feature is disabled, the message, "No Group VPN was defined", is displayed.)

Current Connected (The Group Name of GroupVPN2) users It shows the number of users.

Log Setting Status

It hyperlinks to the *Log* > *System Log* screen of the Log tab.

If you have not set up the e-mail server on the Log tab, the message, "E-mail cannot be sent because you have not specified an outbound SMTP server address," will be displayed.

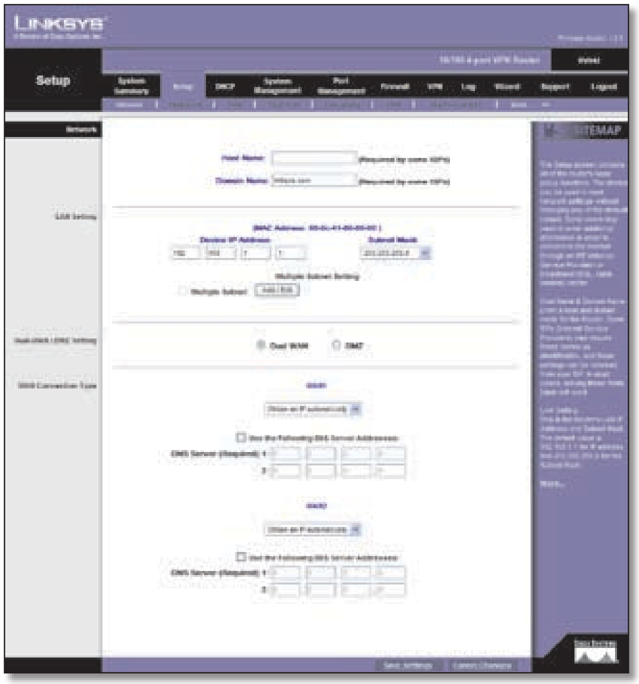
If you have set up the mail server but the log has not been generated due to the Log Queue Length and Log Time Threshold settings, the message, "E-mail settings have been configured," will be displayed.

If you have set up the e-mail server and the log has been sent to the e-mail server, the message, "E-mail settings have been configured and sent out normally," will be displayed.

If you have set up the e-mail server and the log cannot be sent to the e-mail server, the message, "E-mail cannot be sent out, probably use incorrect settings," will be displayed.

Setup Tab > Network

The *Network* screen shows all of the Router's basic setup functions. The Router can be used in most network setups without changing any of the default values; however, you may need to enter additional information in order to connect to the Internet through an ISP (Internet Service Provider) or broadband (DSL or cable) carrier. The setup information is provided by your ISP.



Setup > Network

Network

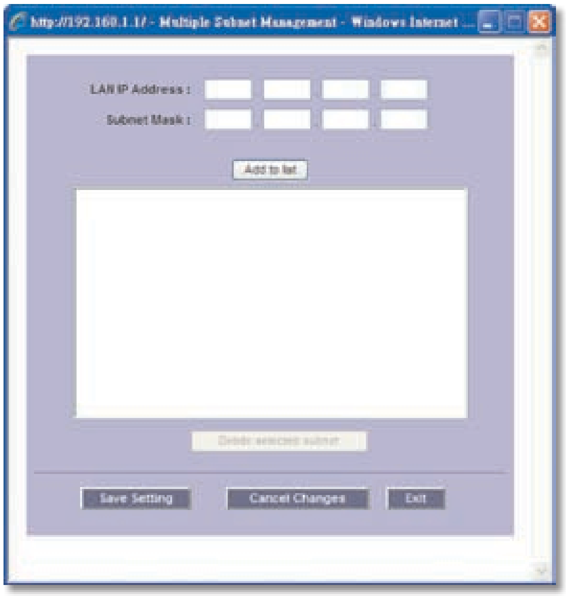
Host Name and Domain Name Enter a host and domain name for the Router. Some ISPs require these names as identification. You may have to check with your ISP to see if your broadband Internet service has been configured with a host and domain name. In most cases, you can leave these fields blank.

LAN Setting

The LAN MAC address of the Router is displayed.

Device IP Address and Subnet Mask The default values are 192.168.1.1 for the Router's local IP address and 255.255.255.0 for the subnet mask.

Multiple Subnet You can add more Class C networks to expand the network. Select this option to enable the Multiple Subnet feature. Then click **Add/Edit** to create or modify subnet(s). A new screen appears.



Create or Modify a Subnet

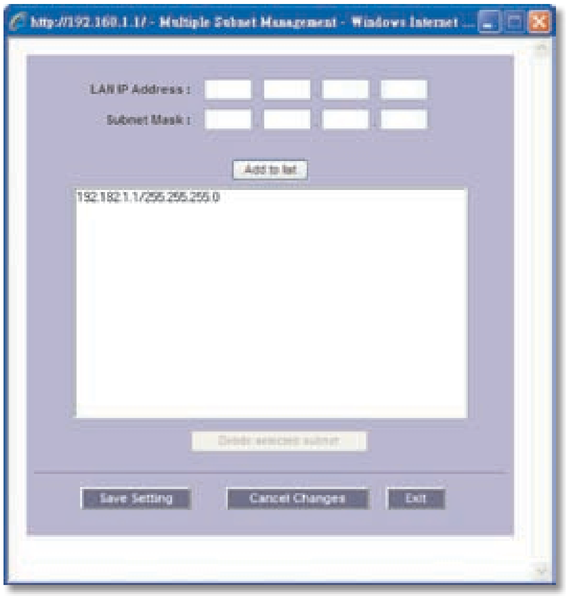
LAN IP Address Enter the LAN IP address.

Subnet Mask Enter the subnet mask.

For example, the current LAN settings show the Device IP Address as 192.168.1.1 and the Subnet Mask as 255.255.255.0. To add one more Class C network, enter the following:

- **LAN IP Address** 192.168.2.1
- **Subnet Mask** 255.255.255.0

Click **Add to List**. Click **Save Settings** to save your changes, or click **Cancel Changes** to undo them. Click **Exit** to return to the *Network* screen.



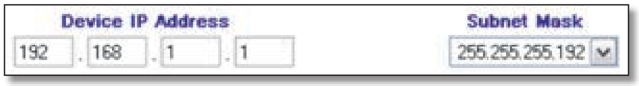
192.182.1.1/255.255.255.0

Add One More Class C Network

If you want to modify a subnet you have created, select it and make changes. Click **Save Settings** to save your changes, or click **Cancel Changes** to undo them. Click **Exit** to return to the *Network* screen.

If you want to delete a subnet you have created, select it and click **Delete selected subnet**. Click **Save Settings** to save your changes, or click **Cancel Changes** to undo them. Click **Exit** to return to the *Network* screen.

You can also divide a Class C network into four subnets. For example, the current LAN settings show the Device IP Address as 192.168.1.1 and the Subnet Mask as 255.255.255.192.



Device IP Address: 192 . 168 . 1 . 1

Subnet Mask: 255.255.255.192

LAN Settings Example

To get the other three subnets, enter the following:

Subnet 1

- **LAN IP Address** 192.168.2.65
- **Subnet Mask** 255.255.255.192

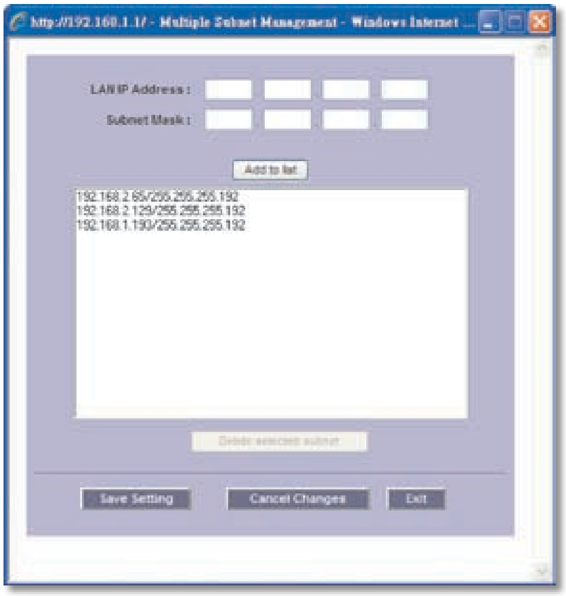
Subnet 2

- **LAN IP Address** 192.168.2.129
- **Subnet Mask** 255.255.255.192

Subnet 3

- **LAN IP Address** 192.168.2.193
- **Subnet Mask** 255.255.255.192

Click **Add to List**. Then click **Save Settings**.



http://192.168.1.1/ - Multiple Subnet Management - Windows Internet ...

LAN IP Address :

Subnet Mask :

192.168.2.65/255.255.255.192
192.168.2.129/255.255.255.192
192.168.1.193/255.255.255.192

Create Three Additional Subnets

Dual-WAN/DMZ Setting

Before configuring the WAN Connection Type settings, select **Dual WAN** or **DMZ**. The Dual WAN setting allows you to simultaneously connect two broadband connections to the Router. On the *System Management > Dual-WAN* screen, you can specify using one as a primary connection, with Smart Link Backup or using both connections in concert, with Load Balance. The DMZ setting allows one network PC to be exposed to the Internet to use special-purpose services, such as Internet gaming or videoconferencing.

WAN Connection Type

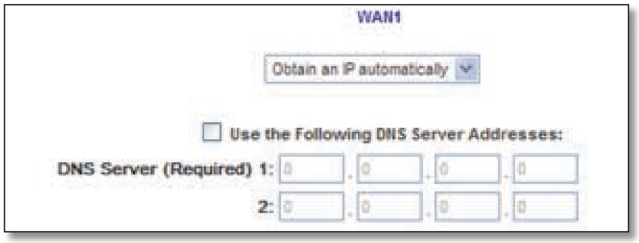
Configure the settings for the WAN or DMZ ports.

WAN1/2

These are the available connection types: Obtain an IP automatically, Static IP, PPPoE, PPTP, and Heart Beat Signal. Depending on which connection type you select, you will see various settings.

Obtain an IP Automatically

If your ISP automatically assigns an IP address, select **Obtain an IP automatically**. (Most cable modem subscribers use this connection type.) Your ISP assigns these values.



WAN1

Obtain an IP automatically

□ Use the Following DNS Server Addresses:

DNS Server (Required) 1: 0 . 0 . 0 . 0

2: 0 . 0 . 0 . 0

Obtain an IP Automatically

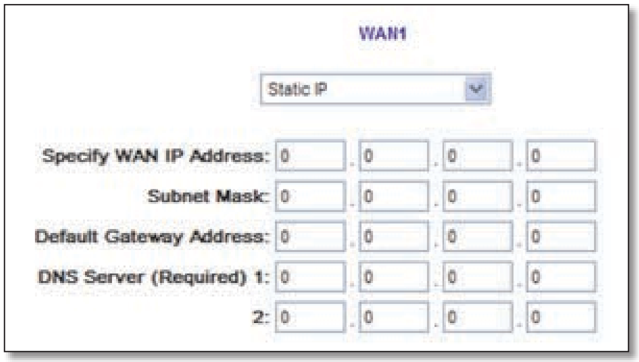
Use the Following DNS Server Addresses If you want to specify DNS server IP addresses, select this option.

DNS Server (Required) 1/2 If you select Use the Following DNS Server Addresses, enter at least one DNS server IP address. Multiple DNS server IP settings are common. In most cases, the first available DNS entry is used.

Click **Save Settings** to save your changes, or click **Cancel Changes** to undo them.

Static IP

If you are required to use a permanent IP address, select **Static IP**.



WAN1

Static IP

Specify WAN IP Address: 0 . 0 . 0 . 0

Subnet Mask: 0 . 0 . 0 . 0

Default Gateway Address: 0 . 0 . 0 . 0

DNS Server (Required) 1: 0 . 0 . 0 . 0

2: 0 . 0 . 0 . 0

Static IP

Specify WAN IP Address Enter the external IP address of the Router.

Subnet Mask Enter the subnet mask of the Router.

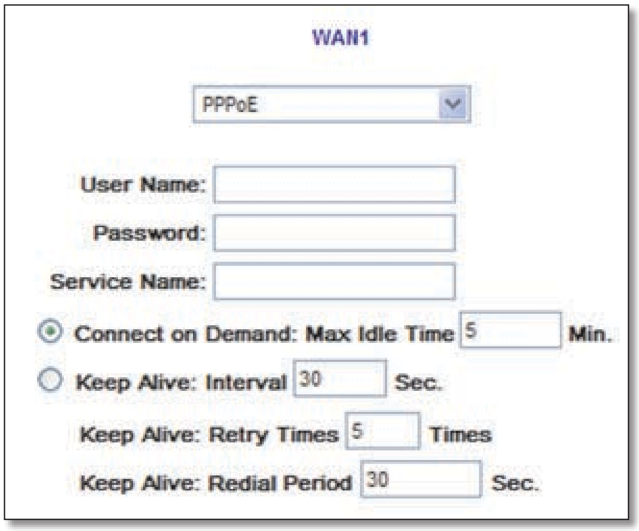
Default Gateway Address Enter the IP address of the default gateway.

DNS Server (Required) 1/2 Enter at least one DNS server IP address. Multiple DNS server IP settings are common. In most cases, the first available DNS entry is used.

Click **Save Settings** to save your changes, or click **Cancel Changes** to undo them.

PPPoE (Point-to-Point Protocol over Ethernet)

Some DSL-based Internet Service Providers (ISPs) use PPPoE (Point-to-Point Protocol over Ethernet) to establish Internet connections for end-users. If you use a DSL line, check with your ISP to see if they use PPPoE, select **PPPoE**.



WAN1

PPPoE

User Name:

Password:

Service Name:

● Connect on Demand: Max Idle Time 5 Min.

○ Keep Alive: Interval 30 Sec.

Keep Alive: Retry Times 5 Times

Keep Alive: Redial Period 30 Sec.

PPPoE

User Name and Password Enter your account's User Name and Password. The maximum number of characters is 60.

Service Name Enter the Service Name, if provided by your ISP.

Connect on Demand If you select the Connect on Demand option, the connection will be disconnected after a specified period of inactivity (Max Idle Time). If you have been disconnected due to inactivity, Connect on Demand enables the Router to automatically re-establish your connection as soon as you attempt to access the Internet again. Enter the number of minutes you want to have elapsed before your Internet access disconnects. The default Max Idle Time is **5** minutes.

Keep Alive: Interval If you select the Keep Alive option, the Router will send keep-alive packets as often as you specify. The default Interval is **30** seconds.

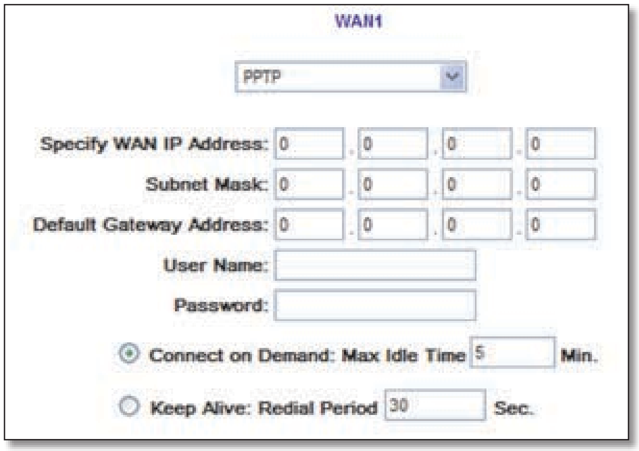
Keep Alive: Retry Times If you select the Keep Alive option, the Router will send keep-alive packets as many times as you specify. If the Router does not receive a response from the ISP, then the Router will terminate the connection and start sending PADI packets after the Redial Period. The default Retry Times is **5** times.

Keep Alive: Redial Period If you select the Keep Alive option, the Router will keep the connection alive by sending out a few data packets periodically, so your ISP thinks that the connection is still active. This option keeps your connection active indefinitely, even when it sits idle. The default Redial Period is **30** seconds.

Click **Save Settings** to save your changes, or click **Cancel Changes** to undo them.

PPTP (Point-to-Point Tunneling Protocol)

Point to Point Tunneling Protocol (PPTP) is a service used in Europe, Israel, and other countries.



WAN1

PPTP

Specify WAN IP Address: 0 . 0 . 0 . 0

Subnet Mask: 0 . 0 . 0 . 0

Default Gateway Address: 0 . 0 . 0 . 0

User Name:

Password:

● Connect on Demand: Max Idle Time 5 Min.

○ Keep Alive: Redial Period 30 Sec.

PPTP

Specify WAN IP Address Enter the external IP address of the Router.

Subnet Mask Enter the subnet mask of the Router.

Default Gateway Address Enter the IP address of the default gateway.

User Name and Password Enter your account's User Name and Password. The maximum number of characters is 60.

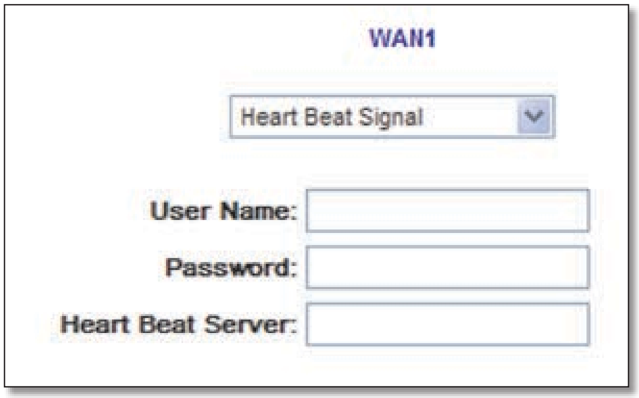
Connect on Demand If you select the Connect on Demand option, the connection will be disconnected after a specified period of inactivity (Max Idle Time). If you have been disconnected due to inactivity, Connect on Demand enables the Router to automatically re-establish your connection as soon as you attempt to access the Internet again. Enter the number of minutes you want to have elapsed before your Internet access disconnects. The default Max Idle Time is **5** minutes.

Keep Alive If you select the Keep Alive option, the Router will keep the connection alive by sending out a few data packets periodically, so your ISP thinks that the connection is still active. This option keeps your connection active indefinitely, even when it sits idle. The default Redial Period is **30** seconds.

Click **Save Settings** to save your changes, or click **Cancel Changes** to undo them.

Heart Beat Signal

Heart Beat Signal is a service used in Australia only.



WAN1

Heart Beat Signal

User Name:

Password:

Heart Beat Server:

Heart Beat Signal

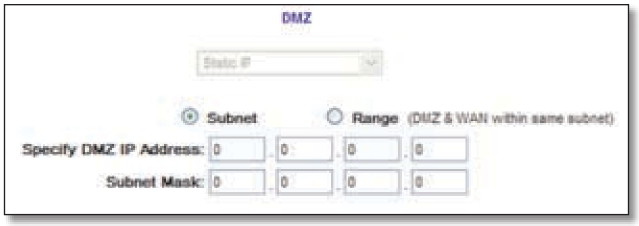
User Name and Password Enter your account's User Name and Password. The maximum number of characters is 60.

Heart Beat Server Enter the IP address of the Heart Beat server.

Click **Save Settings** to save your changes, or click **Cancel Changes** to undo them.

DMZ

Static IP is automatically selected. There are two different DMZ settings: Subnet and Range.



DMZ

Static IP

● Subnet ○ Range (DMZ & WAN within same subnet)

Specify DMZ IP Address: 0 . 0 . 0 . 0

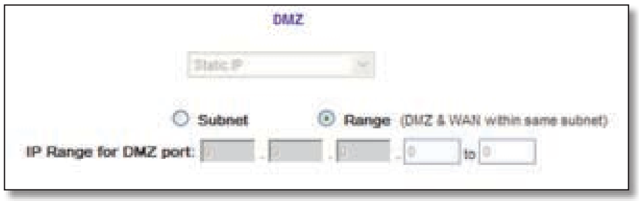
Subnet Mask: 0 . 0 . 0 . 0

DMZ (Subnet)

Subnet To specify a subnet, select this option and configure the following:

- **Specify DMZ IP Address** Enter the IP address of the computer connected to the DMZ port.
- **Subnet Mask** Enter the subnet mask of the computer connected to the DMZ port.

Click **Save Settings** to save your changes, or click **Cancel Changes** to undo them.



DMZ

Static IP

○ Subnet ● Range (DMZ & WAN within same subnet)

IP Range for DMZ port: 0 . 0 . 0 . 0 to 0

DMZ (Range)

Range If Range is selected, the DMZ port and the WAN port will be in the same subnet. To specify a range, select this option and configure the following:

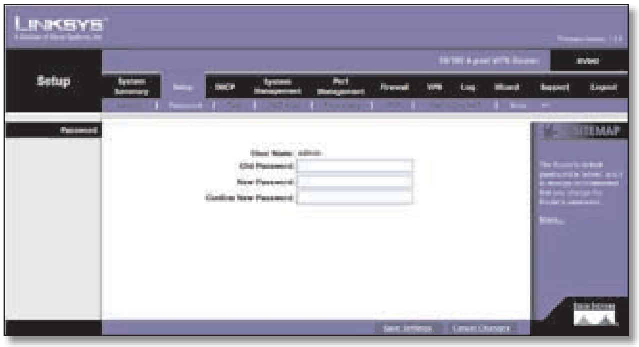
- **IP Range for DMZ port** Enter the starting and ending IP addresses.

Click **Save Settings** to save your changes, or click **Cancel Changes** to undo them.

Setup > Password

The Router's default User Name and Password is **admin**, and Linksys strongly recommends that you change the Router's password from the default to a unique password.

NOTE: The password cannot be recovered if it is lost or forgotten. If the password is lost or forgotten, you have to reset the Router to its factory default settings; this will remove all of your configuration changes.



Setup > Password

Password

The User Name is **admin**; it cannot be changed.

Old Password Enter the old password. The default is **admin** when you first power up the Router.

New Password Enter a new password for the Router. Your password must have 20 or fewer characters and cannot contain any spaces.

Confirm New Password Re-enter the new password to confirm it.

Click **Save Settings** to save your change, or click **Cancel Changes** to undo it.

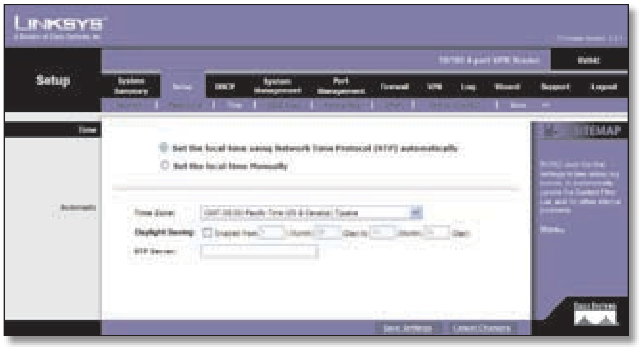
Setup > Time

The Router uses the time settings to time stamp log events, automatically apply the Access Rules and Content Filter, and perform other activities for other internal purposes.

Time

To set the local time, select **Set the local time using the Network Time Protocol (NTP) automatically** or **Set the local time Manually**.

Automatic



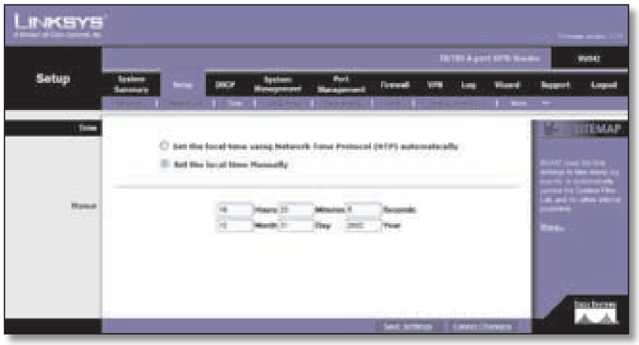
Setup > Time > Automatic

Time Zone Select your time zone. The default is **(GMT-08:00) Pacific Time (US & Canada); Tijuana**.

Daylight Saving To use the daylight saving feature, select **Enabled**. Enter the Month and Day of the start date, and then enter the Month and Day of the end date.

NTP Server Enter the URL or IP address of the NTP server. The default is **time.nist.gov**.

Manual



Setup > Time > Manual

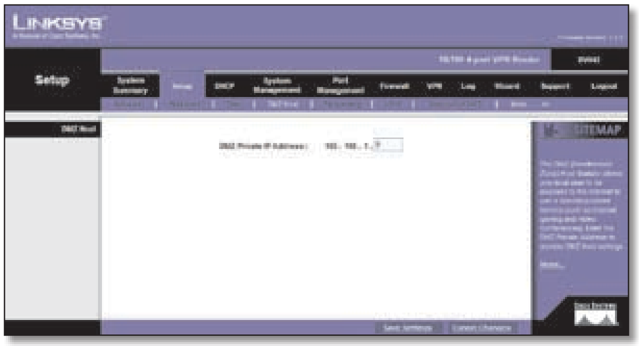
Hours, Minutes, Seconds Enter the time.

Month, Day, Year Enter the date.

Click **Save Settings** to save your changes, or click **Cancel Changes** to undo them.

Setup > DMZ Host

The DMZ (Demilitarized Zone) Host feature allows one local user to be exposed to the Internet for use of a special-purpose service such as Internet gaming or videoconferencing. Although Port Range Forwarding can only forward ten ranges of ports maximum, DMZ hosting forwards all the ports to one computer at the same time.



Setup > DMZ Host

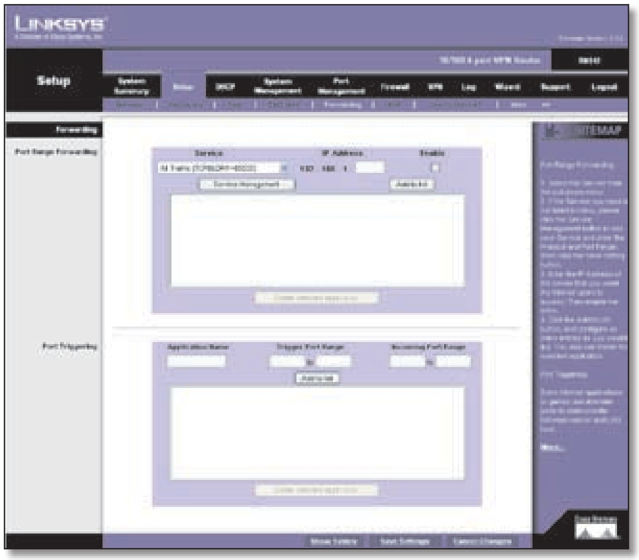
DMZ Host

DMZ Private IP Address Enter the local IP address of the computer you want to expose. The default value of **0** deactivates the DMZ Host.

Click **Save Settings** to save your change, or click **Cancel Changes** to undo it.

Setup Tab > Forwarding

The *Forwarding* screen allows you to set up port range forwarding and port triggering applications. Port range forwarding can be used to set up public services or other specialized Internet applications on your network, while port triggering can be used to set up triggered ranges and forwarded ranges for Internet applications.



Setup > Forwarding

Forwarding

Port Range Forwarding

Port forwarding can be used to set up public services on your network. When users from the Internet make certain requests on your network, the Router can forward those requests to computers equipped to handle the requests. If, for example, you set the port number 80 (HTTP) to be forwarded to IP address 192.168.1.2, then all HTTP requests from outside users will be forwarded to 192.168.1.2.

NOTE: You must disable the Router's DHCP function to use port forwarding.

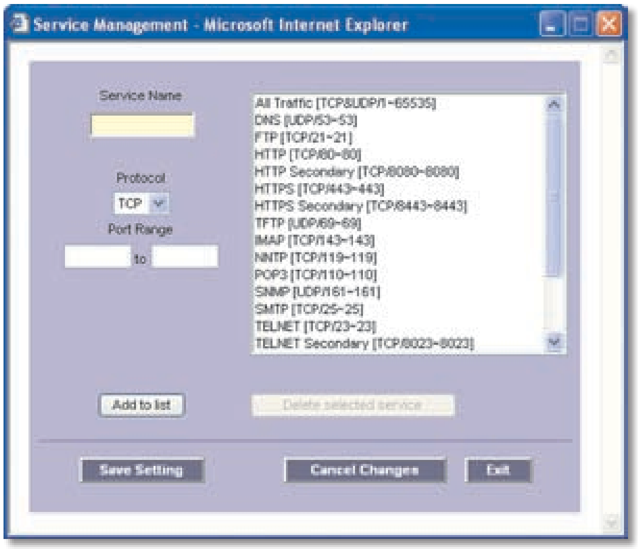
You may use this function to establish a web server or FTP server via an IP gateway. Make sure that you enter a valid IP address. (You may need to establish a static IP address in order to properly run an Internet server.) For added security, Internet users will be able to communicate with the server, but they will not actually be connected. The packets will simply be forwarded through the Router.

Service Select the Service you want.

IP Address Enter the IP address of the server that you want the Internet users to access.

Enable Select **Enable** to enable this port range forwarding entry.

If the Service you need is not listed in the menu, click **Service Management** to add the new service. The *Service Management* screen appears.



Service Name

Protocol: TCP

Port Range: to

All Traffic [TCP&UDP/1~65535]
DNS [UDP/53~53]
FTP [TCP/21~21]
HTTP [TCP/80~80]
HTTP Secondary [TCP/8080~8080]
HTTPS [TCP/443~443]
HTTPS Secondary [TCP/8443~8443]
TFTP [UDP/69~69]
IMAP [TCP/143~143]
NNTP [TCP/119~119]
POP3 [TCP/110~110]
SNMP [UDP/161~161]
SMTP [TCP/25~25]
TELNET [TCP/23~23]
TELNET Secondary [TCP/8023~8023]

Service Management

Service Name Enter a name.

Protocol Select the protocol it uses.

Port Range Enter its range.

Click **Add to List**. Click **Save Settings** to save your changes, or click **Cancel Changes** to undo them. Click **Exit** to return to the *Forwarding* screen.

If you want to modify a service you have created, select it and click **Update this service**. Make changes. Click **Save Settings** to save your changes, or click **Cancel Changes** to undo them. Click **Exit** to return to the *Forwarding* screen.

If you want to delete a service you have created, select it and click **Delete selected service**. Click **Save Settings** to save your changes, or click **Cancel Changes** to undo them. Click **Exit** to return to the *Forwarding* screen.

On the *Forwarding* screen, click **Add to List**, and configure as many entries as you would like, up to a maximum of 30. To delete an entry, select it and click **Delete selected application**.

Port Triggering

Port triggering allows the Router to watch outgoing data for specific port numbers. The IP address of the computer that sends the matching data is remembered by the Router, so that when the requested data returns through the Router, the data is pulled back to the proper computer by way of IP address and port mapping rules.

Some Internet applications or games use alternate ports to communicate between the server and LAN host. When you want to use these applications, enter the triggering (outgoing) port and alternate incoming port in the Port Triggering table. Then the Router will forward the incoming packets to the LAN host.

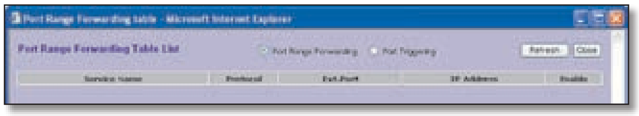
Application Name Enter the name of the application.

Trigger Port Range Enter the starting and ending port numbers of the trigger port range.

Incoming Port Range Enter the starting and ending port numbers of the incoming port range.

Click **Add to List**, and configure as many entries as you would like, up to a maximum of 30. To delete an entry, select it and click **Delete selected application**.

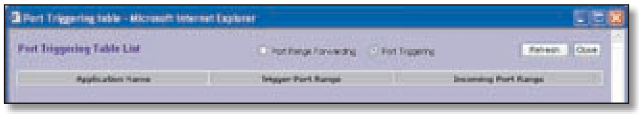
Click **Show Tables** to see the details of your entries. The Port Range Forwarding Table List appears.



Port Range Forwarding Table List

Port Range Forwarding Select this option to view the Port Range Forwarding entries.

Port Triggering Select this option to view the Port Triggering entries.



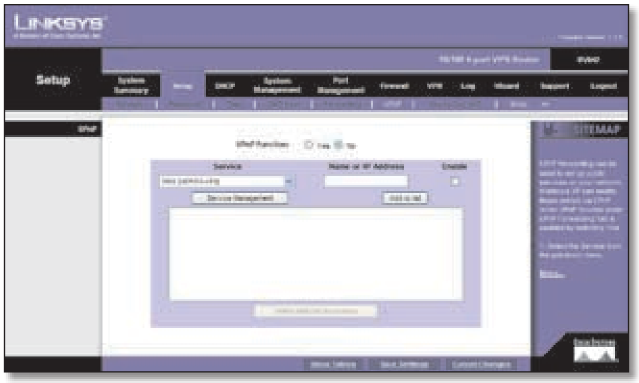
Port Triggering Table List

Click **Refresh** to update the on-screen information. Click **Close** to exit this screen and return to the *Forwarding* screen.

On the *Forwarding* screen, click **Save Settings** to save your changes, or click **Cancel Changes** to undo them.

Setup > UPnP

Universal Plug and Play (UPnP) can be used to set up public services on your network. When the UPnP function is enabled, Windows XP or Vista can modify these entries via UPnP.



Setup > UPnP

UPnP

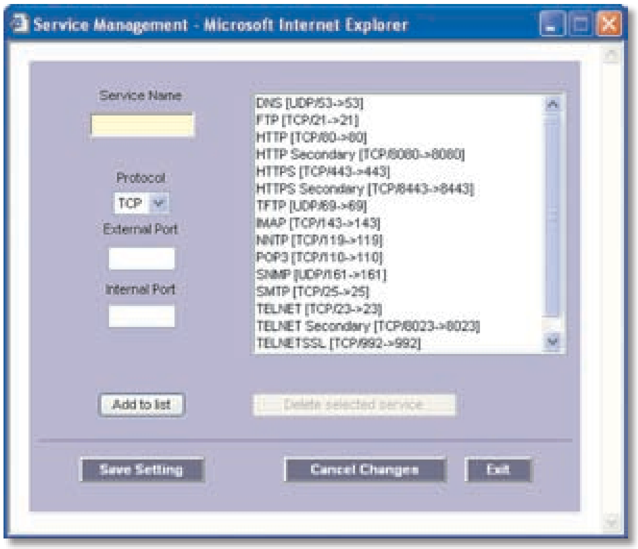
UPnP Function Select **Yes** to enable the UPnP function. Otherwise, keep the default, **No**.

Service Select the Service you want.

Name or IP Address Enter the name or IP address of the server that you want the Internet users to access.

Enable Select **Enable** to enable this UPnP entry.

If the Service you need is not listed in the menu, click **Service Management** to add the new service. The *Service Management* screen appears.



Service Management

Service Name Enter a name.

Protocol Select the protocol it uses.

External Port Enter the external port number.

Internal Port Enter the internal port number.

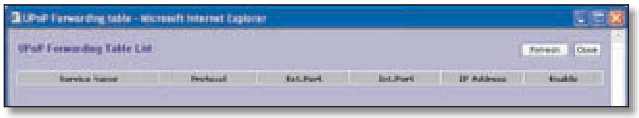
Click **Add to List**. Click **Save Settings** to save your changes, or click **Cancel Changes** to undo them. Click **Exit** to return to the *UPnP* screen.

If you want to modify a service you have created, select it and click **Update this service**. Make changes. Click **Save Settings** to save your changes, or click **Cancel Changes** to undo them. Click **Exit** to return to the *UPnP* screen.

If you want to delete a service you have created, select it and click **Delete selected service**. Click **Save Settings** to save your changes, or click **Cancel Changes** to undo them. Click **Exit** to return to the *UPnP* screen.

On the *UPnP* screen, click **Add to List**, and configure as many entries as you would like, up to a maximum of 30. To delete an entry, select it and click **Delete selected application**.

Click **Show Tables** to see the details of your entries. The UPnP Forwarding Table List appears.



UPnP Forwarding table - Microsoft Internet Explorer

UPnP Forwarding Table List

Service Name	Protocol	Ext.Port	Int.Port	IP Address	Enable

UPnP Forwarding Table List

Click **Refresh** to update the on-screen information. Click **Close** to exit this screen and return to the *UPnP* screen.

On the *UPnP* screen, click **Save Settings** to save your changes, or click **Cancel Changes** to undo them.

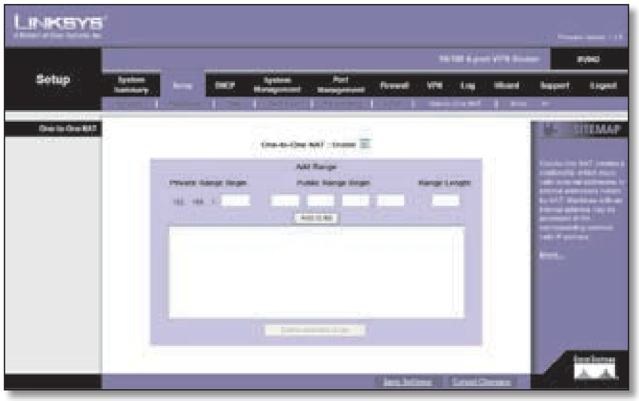
Setup > One-to-One NAT

One-to-One NAT (Network Address Translation) creates a relationship that maps valid external IP addresses to internal IP addresses hidden by NAT. A device with an internal IP address may be accessed at the corresponding external valid IP address.

To create this relationship, define internal and external IP address ranges of equal length. Once the relationship is defined, the device with the first internal IP address is accessible at the first IP address in the external IP address range, and so forth.

For example, you have a Local Area Network (LAN) for which the ISP has assigned the IP address range of 209.19.28.16 to 209.19.28.31, with 209.19.28.16 used as the Wide Area Network (WAN) or NAT public IP address of the Router. The address range of 192.168.168.1 to 192.168.168.255 is used for the devices on the LAN. With One-to-One NAT, the devices with the internal IP addresses of 192.168.168.2 to 192.168.168.15 may be accessed at the corresponding external IP addresses.

> **NOTE:** The Router's WAN IP address should not be included in the range you specify.



Setup > One-to-One NAT

One-to-One NAT

One-to-One NAT Select **Enable** to use the One-to-One NAT function.

Add Range

Private Range Begin Enter the starting IP address of the internal IP address range. This is the IP address of the first device that can be accessed from the Internet.

Public Range Begin Enter the starting IP address of the public IP address range. This IP address is provided by the ISP. (Do not include the Router's WAN IP Address.)

Range Length Enter the number of IP addresses in the range. The range length cannot exceed the number of valid IP addresses. To map a single address, enter **1**.

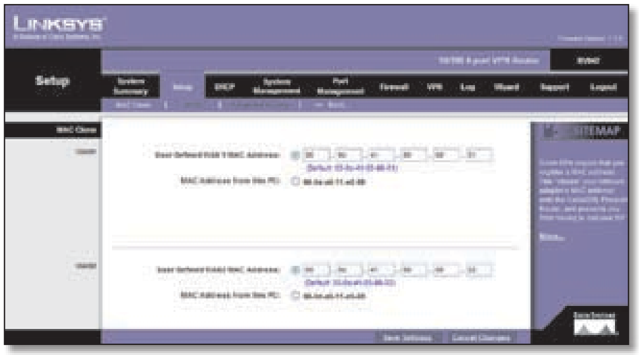
Click **Add to List**, and configure as many entries as you would like, up to a maximum of ten. To delete an entry, select it and click **Delete selected range**.

> **NOTE:** One-to-One NAT affects how the firewall functions work. Access to LAN devices from the Internet is allowed unless additional Deny access rules are configured on the *Firewall > Access Rules* screen.

Click **Save Settings** to save your changes, or click **Cancel Changes** to undo them.

Setup > MAC Clone

Some ISPs require that you register a MAC address, which is a 12-digit code assigned to a unique piece of hardware for identification. The MAC Clone feature "clones" your network adapter's MAC address onto the Router, so you don't have to call your ISP to change the registered MAC address to the Router's MAC address.



Setup > MAC Clone

MAC Clone

WAN1/2

If you have enabled the Dual WAN feature, then you will have two ports, WAN1 and WAN2, available for MAC address assignment or cloning.

User Defined WAN MAC Address To manually clone a MAC address, select **User Defined WAN MAC Address**, and then enter the 12 digits of your adapter's MAC address.

MAC Address from this PC To clone the MAC address of the computer you are currently using to configure the Router, select **MAC Address from this PC**.

Click **Save Settings** to save your changes, or click **Cancel Changes** to undo them.

Setup > DDNS

Dynamic Domain Name System (DDNS) service allows you to assign a fixed domain name to a dynamic WAN IP address, so you can host your own web, FTP or other type of TCP/IP server in your LAN. The DDNS feature is disabled by default.

Before configuring DDNS, visit the website of the DDNS service you want to use: **www.dyndns.org**, **www.3322.org**, or **www.oray.net**. Then register a domain name.

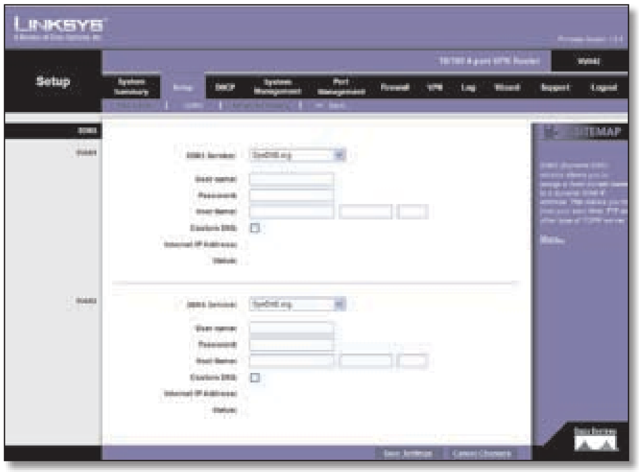
DDNS

WAN1/2

If you have enabled the Dual WAN feature, then you will have two ports, WAN1 and WAN2, available for DDNS service.

DDNS Service The DDNS feature is disabled by default. To enable this feature, select **DynDNS.org**, **3322.org**, or **Oray.net PeanutHull DDNS**.

DynDNS.org



Setup > DDNS > DynDNS.org

User name Enter your DynDNS.org account information.

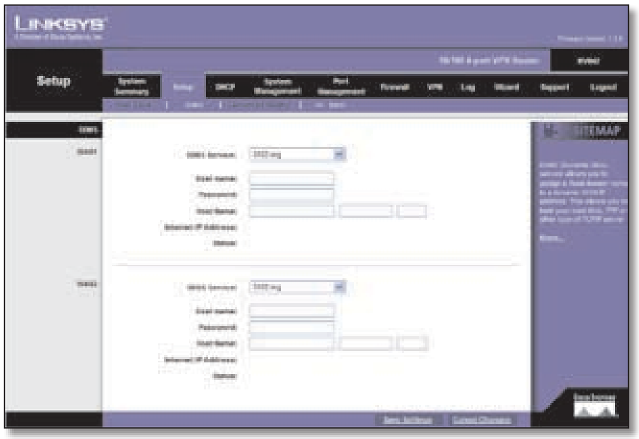
Password Enter your DynDNS.org account information.

Host Name Enter your host name in the three *Host Name* fields. For example, if your host name were myhouse.dyndns.org, then myhouse would go into the first field, dyndns would go into the second field, and org would go into the last field.

Custom DNS DynDNS.org offers a free account and a paid account, which use different authentication methods. If you have a paid account, select this option to register the paid account with the DDNS server of DynDNS.org.

Click **Save Settings**, and the status of the DDNS function will be updated.

3322.org



Setup > DDNS > 3322.org

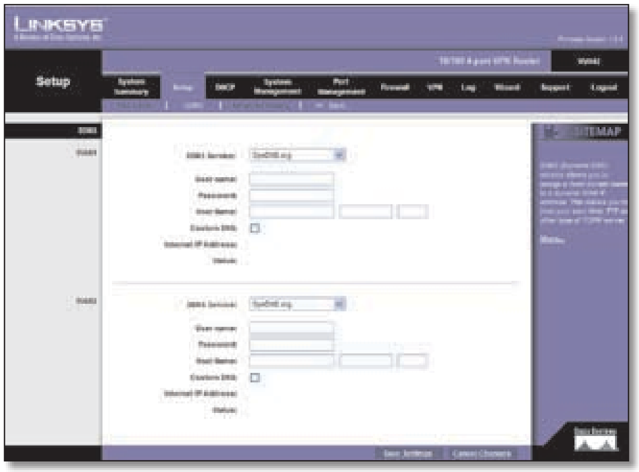
User name Enter your 3322.org account information.

Password Enter your 3322.org account information.

Host Name Enter your host name in the three *Host Name* fields. For example, if your host name were myhouse.3322.org, then myhouse would go into the first field, 3322 would go into the second field, and org would go into the last field.

Click **Save Settings**, and the status of the DDNS function will be updated.

Oray.net PeanutHull DDNS



DDNS

DDNS Service:

User name:

Password:

Host Name:

Custom DNS: □

Internet IP Address:

Status:

DDNS Service:

User name:

Password:

Host Name:

Custom DNS: □

Internet IP Address:

Status:

Setup > DDNS > Oray.net PeanutHull DDNS

User name Enter your PeanutHull account information.

Password Enter your PeanutHull account information.

Host Name Enter your host name in the three *Host Name* fields. For example, if your host name were myhouse.oray.net, then myhouse would go into the first field, oray would go into the second field, and net would go into the last field.

Click **Save Settings**, and the status of the DDNS function will be updated.

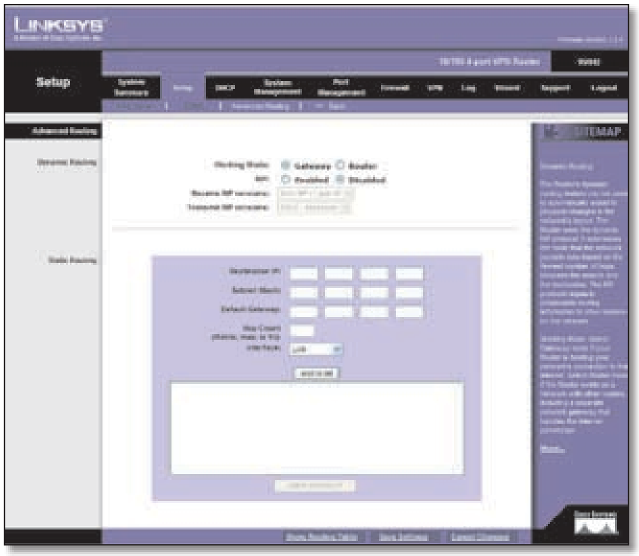
Internet IP Address The Router's current Internet IP address is displayed. Because it is dynamic, this will change.

Status The status of the DDNS function is displayed. If the status information indicates an error, make sure you have correctly entered the information for your account with your DDNS service.

Click **Save Settings** to save your changes, or click **Cancel Changes** to undo them.

Setup > Advanced Routing

The *Advanced Routing* screen allows you to configure the dynamic and static routing settings.



Advanced Routing

Dynamic Routing

Working Mode: ● Gateway ○ Router

RIP: ○ Enabled ● Disabled

Receive RIP versions:

Transmit RIP versions:

Static Routing

Destination IP:

Subnet Mask:

Default Gateway:

Hop Count (Metric, max. is 15):

Interface: LAN

Setup > Advanced Routing

Advanced Routing

Dynamic Routing

The Router's dynamic routing feature can be used, so the Router will automatically adjust to physical changes in the network's layout. Using the dynamic RIP protocol, the Router calculates the most efficient route for the network's data packets to travel between the source and the destination, based upon the shortest paths. The RIP protocol regularly broadcasts routing information to other routers on the network. It determines the route that the network packets take based on the fewest number of hops between the source and the destination.

Working Mode Select **Gateway** mode if the Router is hosting your network's connection to the Internet. Select **Router** mode if the Router exists on a network with other routers, including a separate network gateway that handles the Internet connection. In Router mode, any computer connected to the Router will not be able to connect to the Internet unless you have another router function as the gateway.

RIP (Routing Information Protocol) To use dynamic routing for communication of network data, select **Enabled**. Otherwise, keep the default, **Disabled**.

Receive RIP versions To use dynamic routing for reception of network data, select the protocol you want: **None**, **RIPv1**, **RIPv2**, or **Both RIP v1 and v2**.

Transmit RIP versions To use dynamic routing for transmission of network data, select the protocol you want: **None**, **RIPv1**, **RIPv2 - Broadcast**, or **RIPv2 - Multicast**.

Static Routing

If the Router is connected to more than one network or there are multiple routers installed on your network, it may be necessary to set up static routes. The static routing function determines the path that data follows over your network before and after it passes through the Router. You can use static routing to allow different IP domain users to access the Internet through the Router.

Static routing is a powerful feature that should be used by advanced users only. In many cases, it is better to use dynamic routing because it enables the Router to automatically adjust to physical changes in the network's layout.

NOTE: Static routing is an advanced feature. Create these routes with care.

To create a static route entry, enter the following information:

Destination IP Enter the network address of the remote LAN segment. For a standard Class C IP domain, the network address is the first three fields of the Destination LAN IP, while the last field should be 0.

Subnet Mask Enter the subnet mask used on the destination LAN IP domain. For Class C IP domains, the subnet mask is 255.255.255.0.

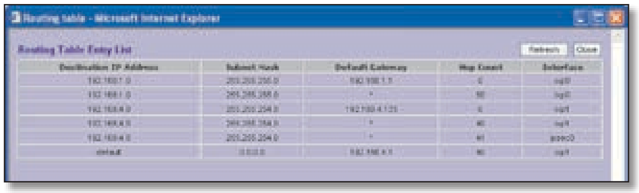
Default Gateway Enter the IP address of the router of the network, for which this static route is created. For example, if this network is connected to the local router's LAN port through another router, use the WAN IP address of that router.

Hop Count Enter the appropriate value (maximum is 15). This indicates the number of nodes that a data packet passes through before reaching its destination. A node is any device on the network, such as a computer or router.

Interface Select the appropriate interface. The Interface tells you whether your network is on the LAN, WAN1, or WAN2/DMZ. If the gateway router is on a LAN port, then select **LAN**. If you're connecting to another network through the Internet, select the appropriate WAN port option.

Click **Add to List**, and configure as many entries as you would like, up to a maximum of 30. To delete an entry, select it and click **Delete selected IP**.

Click **Show Routing Table** to see the details of your entries.



Routing Table Entry List

Destination IP Address	Subnet Mask	Default Gateway	Hop Count	Interface
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	*	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	*	[illegible]	[illegible]
[illegible]	[illegible]	*	[illegible]	ipsec0
default	0.0.0.0	[illegible]	[illegible]	[illegible]

Click **Refresh** to update the on-screen information. Click **Close** to exit this screen and return to the *Advanced Routing* screen.

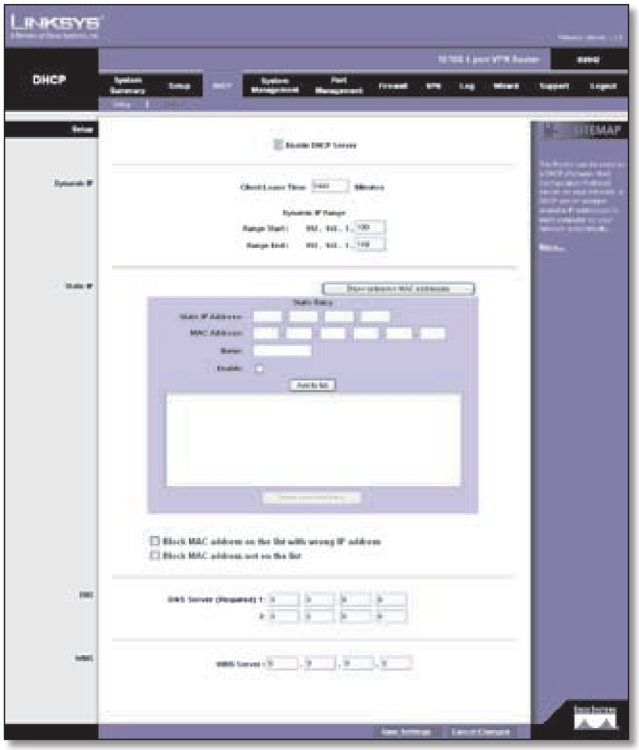
On the *Advanced Routing* screen, click **Save Settings** to save your changes, or click **Cancel Changes** to undo them.

DHCP > Setup

The Router can be used as a DHCP (Dynamic Host Configuration Protocol) server on your network. A DHCP server automatically assigns available IP addresses to computers on your network. If you choose to enable the DHCP server option, all of the computers on your LAN must be set to obtain an IP address automatically from a DHCP server. (By default, Windows computers are set to obtain an IP automatically.)

If the Router's DHCP server function is disabled, do one of the following:

- Configure the IP address, subnet mask, and DNS settings of every computer on your network. (Make sure you do not assign the same IP address to different computers.)
- Set up a stand-alone DHCP server with the Router as the default gateway.



DHCP > Setup

Setup

Enable DHCP Server To use the Router as your network's DHCP server, select **Enable DHCP Server**. If you already have a DHCP server on your network, remove the check mark.

Dynamic IP

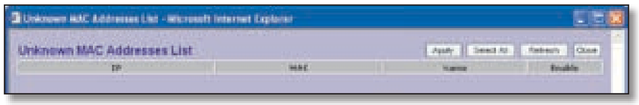
Client Lease Time The Client Lease Time is the amount of time a network user will be allowed connection to the Router with their current dynamic IP address. Enter the amount of time, in minutes, that the user will be "leased" this dynamic IP address. The range is 5-43,200 minutes. The default is **1440** minutes.

Dynamic IP Range Start/End Enter a starting IP address and ending IP address to create a range of available IP addresses. The default range is **100-149**. (Make sure the Router's LAN IP address is not in this dynamic IP range.) For example, if the Router uses the default LAN IP address, **192.168.1.1**, then the starting value must be 192.168.1.2 or greater.

Static IP

You can assign a static IP address to a specific device based on its MAC address.

Show unknown MAC addresses Click **Show unknown MAC addresses** to view all devices' IP addresses and corresponding MAC addresses. The Unknown MAC Addresses List appears.


Unknown MAC Addresses List - Microsoft Internet Explorer
Unknown MAC Addresses List
Apply
Select All
Refresh
Close
IP
MAC
Name
Enable

Unknown MAC Addresses List

To add an IP address and MAC address set to the Static IP list, select **Enable**, and then click **Apply**. To add all IP addresses and MAC addresses to the Static IP list, click **Select All**.

To update the on-screen information, click **Refresh**. To exit this screen and return to the *Setup* screen, click **Close**.

Static IP Address Enter the static IP address. You can enter 0.0.0.0 if you want the Router to assign a static IP address to the device.

MAC Address Enter the MAC address of the device.

Name Enter a descriptive name for the device.

Enable Select **Enable** to assign the static IP address to this device.

Click **Add to List**, and configure as many entries as you would like, up to a maximum of 100. To delete an entry, select it and click **Delete selected Entry**.

Block MAC address on the list with wrong IP address To block traffic from devices with MAC addresses on the Static IP list but using the wrong IP addresses, select this option. It prevents users from changing device IP addresses without your permission.

Block MAC address not on the list To block traffic from devices using dynamic IP addresses, select this option. It blocks all devices with MAC addresses not listed on the Static IP list.

DNS

DNS Server You can assign DNS server(s) to the DHCP clients so the Router will use the DNS server(s) for faster access to functioning DNS server(s). Enter the IP address of at least one DNS server.

WINS

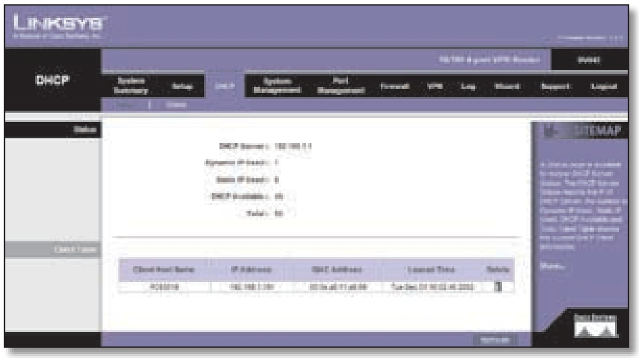
WINS Server Windows Internet Naming Service (WINS) is a service that resolves NetBIOS names to IP addresses. WINS is assigned if the computer (DHCP client) requests one. If you do not know the IP address of the WINS server, keep the default, **0.0.0.0**.

> **NOTE:** To support NetBIOS for DHCP clients, the Router uses two methods.
>
> First, when the DHCP clients receive dynamic IP addresses from the Router, it automatically includes the information of the WINS server to support NetBIOS. Second, if a user sets up a static IP address, then the IP address, subnet mask, default gateway, and DNS server settings must be configured on the Internet Protocol (TCP/IP) screen of the Windows operating system. Then the WINS IP address must be configured on the advanced TCP/IP screen. (For more information, refer to Windows Help.)

Click **Save Settings** to save your changes, or click **Cancel Changes** to undo them.

DHCP > Status

On the *Status* screen, view the status information for the DHCP server and its clients.



DHCP > Status

Status

For the DHCP server, the following information is shown:

DHCP Server This is the IP address of the DHCP server.

Dynamic IP Used It shows the number of dynamic IP addresses used.

Static IP Used It shows the number of static IP addresses used.

DHCP Available This indicates the number of dynamic IP addresses available.

Total It shows the total number of dynamic IP addresses that can be assigned by the DHCP server.

Client Table

For all network clients using the DHCP server, the Client Table shows the current DHCP Client information:

Client Host Name This is the name assigned to a client host.

IP Address It is the dynamic IP address assigned to a client.

MAC Address This indicates the MAC address of a client.

Leased Time It displays the amount of time a network user will be allowed connection to the Router with their current dynamic IP address.

Delete Click the **Trash Can** icon to delete a DHCP client, and the client host's IP address will be released.

Click **Refresh** to update the on-screen information.

System Management Tab > Dual-WAN

There are two functions provided for users, Smart Link Backup and Load Balance. If you selected DMZ on the *Setup > Network* screen, you will not be able to configure the Dual-WAN settings.

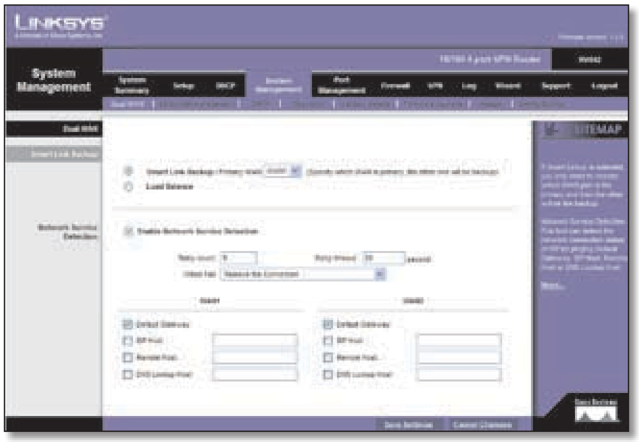
Dual-WAN

Smart Link Backup/Load Balance If you want to use one of the WAN ports as the primary port and the other WAN port as backup, then select **Smart Link Backup**.

If you want the Router to automatically manage the Internet connection through both WAN ports, then select **Load Balance**. The Router will automatically compute the ratio of the bandwidths of WAN1 and WAN2, and then it will use Weighted Round Robin (WRR) to balance the loads of the two WANs.

Proceed to the appropriate section for further instructions.

Smart Link Backup



System Management > Dual-WAN > Smart Link Backup

Primary WAN Specify the primary connection, **WAN1** or **WAN2**.

Network Service Detection

Enable Network Service Detection Network Service Detection helps manage your connection and can report when your connection experiences problems. To use this service, select this option.

Retry Count Enter the number of times the Router will try to reconnect if the connection fails.

Retry Timeout Enter the number of times the Router will try to make a connection to your ISP before it times out.

When Fail Should the connection be lost, set the Router to perform one of the following actions, **Remove the Connection** or **Generate the Error Condition in the System Log**.

- **Remove the Connection** Failover will occur; the backup will be used. When the primary WAN port's connectivity is restored, the backup WAN port will return to standby mode.
- **Generate the Error Condition in the System Log** Failover will not occur; only an error condition will be logged.

Network Service Detection can test a WAN port's network connectivity by pinging the Default Gateway or a specific IP address.

WAN1/2

Default Gateway Select this option to ping the Default Gateway.

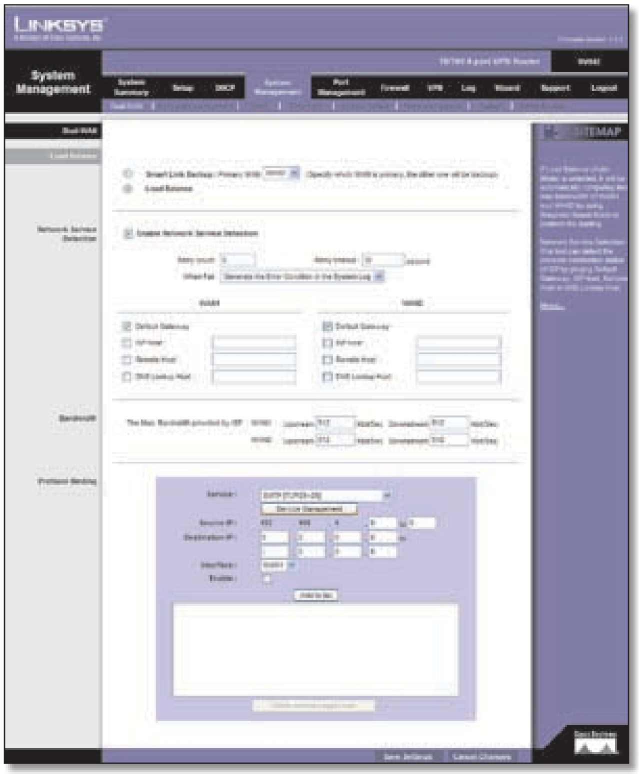
ISP Host Select this option to ping the ISP Host. Then enter the IP address.

Remote Host Select this option to ping the Remote Host. Then enter the IP address.

DNS Lookup Host Select this option to ping the DNS Lookup Host. Then enter the IP address.

Click **Save Settings** to save your changes, or click **Cancel Changes** to undo them.

Load Balance



System Management > Dual-WAN > Load Balance

Network Service Detection

Enable Network Service Detection Network Service Detection helps manage your connection and can report when your connection experiences problems. To use this service, select this option.

Retry Count Enter the number of times the Router will try to reconnect if the connection fails.

Retry Timeout Enter the number of times the Router will try to make a connection to your ISP before it times out.

When Fail Should the connection not be reestablished, set the Router to perform one of the following actions, **Remove the Connection** or **Generate the Error Condition in the System Log**.

Network Service Detection can test this connection by pinging the Default Gateway or a specific IP address.

WAN1/2

Default Gateway Select this option to ping the Default Gateway.

ISP Host Select this option to ping the ISP Host. Then enter the IP address.

Remote Host Select this option to ping the Remote Host. Then enter the IP address.

DNS Lookup Host Select this option to ping the DNS Lookup Host. Then enter the IP address.

Bandwidth

WAN1/2

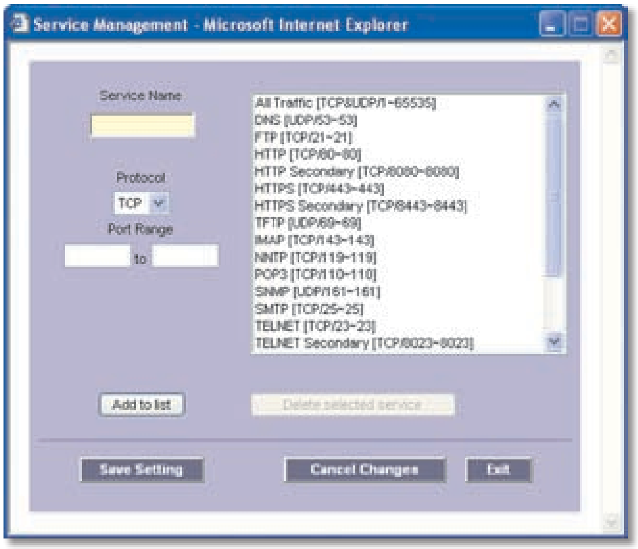
Upstream Enter the maximum upstream bandwidth provided by your ISP. The default is **512** kbit/sec.

Downstream Enter the maximum downstream bandwidth provided by your ISP. The default is **512** kbit/sec.

Protocol Binding

Service Select the Service you want.

If the Service you need is not listed in the menu, click **Service Management** to add the new service. The *Service Management* screen appears.



Service Management

Service Name Enter a name. For IP Binding only, select **All**.

Protocol Select the protocol it uses.

Port Range Enter its range.

Click **Add to List**. Click **Save Settings** to save your changes, or click **Cancel Changes** to undo them. Click **Exit** to return to the *Dual-WAN* screen.

If you want to modify a service you have created, select it and click **Update this service**. Make changes. Click **Save Settings** to save your changes, or click **Cancel Changes** to undo them. Click **Exit** to return to the *Dual-WAN* screen.

If you want to delete a service you have created, select it and click **Delete selected service**. Click **Save Settings** to save your changes, or click **Cancel Changes** to undo them. Click **Exit** to return to the *Dual-WAN* screen.

Source IP Enter the source IP address or range. If you need Service Binding only, then you can keep the default, which is **0**.

Destination IP Enter the destination IP address or range. If you need Service Binding only, then you can keep the default, which is **0**.

Interface Select the appropriate WAN interface, **WAN1** or **WAN2**.

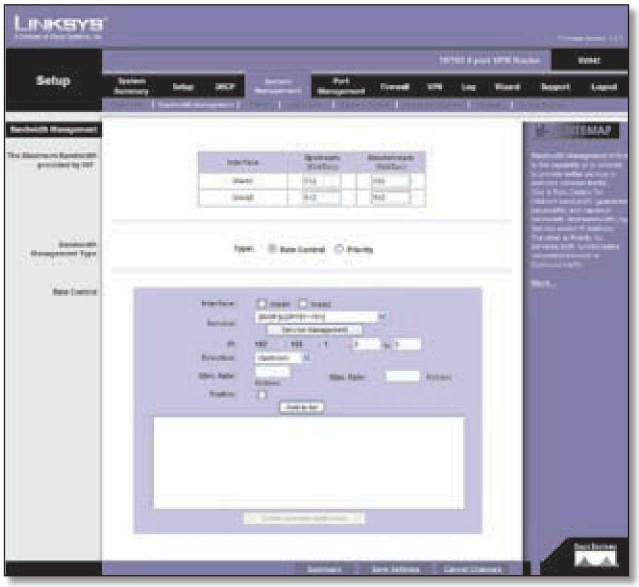
Enable Select **Enable** to use this Protocol Binding rule.

Click **Add to List**, and configure as many rules as you would like, up to a maximum of 100. To delete a rule, select it and click **Delete selected application**.

Click **Save Settings** to save your changes, or click **Cancel Changes** to undo them.

System Management > Bandwidth Management

Quality of Service (QoS) features let you control how the Router manages network traffic. With Bandwidth Management (Layer 3), the Router can provide better service to selected types of network traffic. There are two types of functionality available, and only one type can work at one time. Rate Control functionality is for minimum (guaranteed) bandwidth and maximum bandwidth by service or IP address, while Priority functionality is for services. Both types can control inbound or outbound traffic.



System Management > Bandwidth Management > Rate Control

Bandwidth Management

The Maximum Bandwidth provided by ISP

WAN1/2

Upstream Enter the maximum upstream bandwidth provided by your ISP. The default is **512** kbit/sec.

Downstream Enter the maximum downstream bandwidth provided by your ISP. The default is **512** kbit/sec.

Bandwidth Management Type

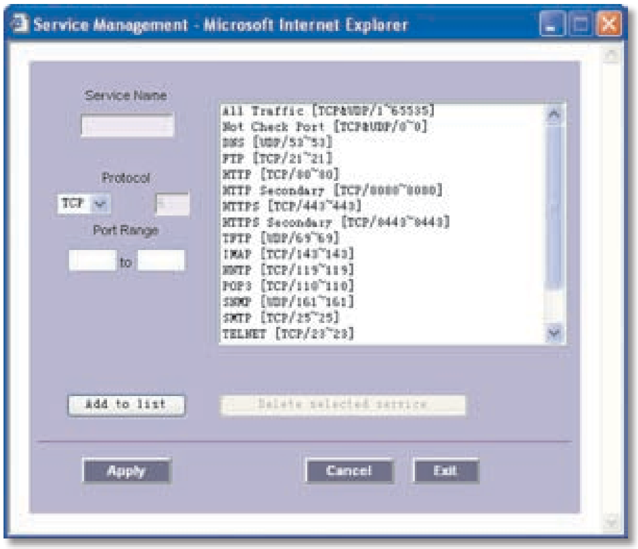
Type Select the type of functionality you want to use, **Rate Control** or **Priority**. Rate Control functionality is for minimum (guaranteed) bandwidth and maximum (limited) bandwidth by service or IP address, while Priority functionality is for services. Then proceed to the instructions for the type you selected.

Rate Control

Interface Select the appropriate WAN interface, **WAN1** or **WAN2**.

Service Select the Service you want.

If the Service you need is not listed in the menu, click **Service Management** to add the new service. The *Service Management* screen appears.



All Traffic [TCP&UDP/1~65535]
Not Check Port [TCP&UDP/0~0]
DNS [UDP/53~53]
FTP [TCP/21~21]
HTTP [TCP/80~80]
HTTP Secondary [TCP/8080~8080]
HTTPS [TCP/443~443]
HTTPS Secondary [TCP/8443~8443]
TFTP [UDP/69~69]
IMAP [TCP/143~143]
NNTP [TCP/119~119]
POP3 [TCP/110~110]
SNMP [UDP/161~161]
SMTP [TCP/25~25]
TELNET [TCP/23~23]

Service Management

Service Name Enter a name.

Protocol Select the protocol it uses.

Port Range Enter its range.

Click **Add to List**. Click **Save Settings** to save your changes, or click **Cancel Changes** to undo them. Click **Exit** to return to the *Bandwidth Management* screen.

If you want to modify a service you have created, select it and click **Update this service**. Make changes. Click **Save Settings** to save your changes, or click **Cancel Changes** to undo them. Click **Exit** to return to the *Bandwidth Management* screen.

If you want to delete a service you have created, select it and click **Delete selected service**. Click **Save Settings** to save your changes, or click **Cancel Changes** to undo them. Click **Exit** to return to the *Bandwidth Management* screen.

IP Enter the IP address or range you need to control. To include all internal IP addresses, keep the default, **0**.

Direction Select **Upstream** for outbound traffic, or select **Downstream** for inbound traffic.

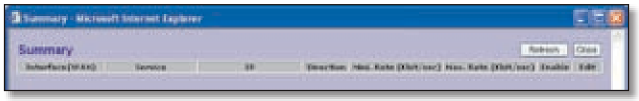
Min. Rate Enter the minimum rate for the guaranteed bandwidth.

Max. Rate Enter the maximum rate for the maximum bandwidth.

Enable Select **Enable** to use this Rate Control rule.

Click **Add to List**, and configure as many rules as you would like, up to a maximum of 100. To delete a rule, select it and click **Delete selected application**.

Click **Summary** to see a summary of the Rate Control rules.

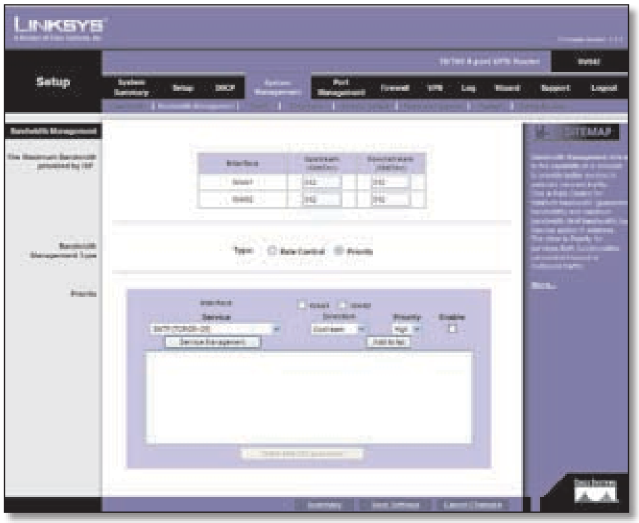


Summary (Rate Control Selected)

To change a rule, click **Edit**. To update the list, click **Refresh**. To return to the *Bandwidth Management* screen, click **Close**.

On the *Bandwidth Management* screen, click **Save Settings** to save your changes, or click **Cancel Changes** to undo them.

Priority

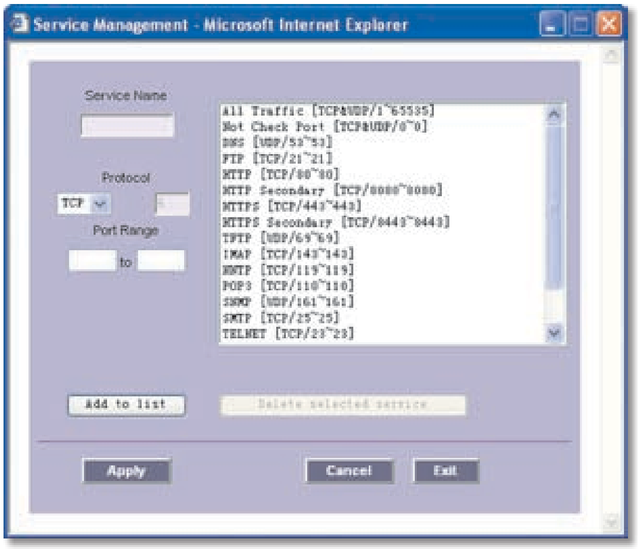


System Management > Bandwidth Management > Priority

Interface Select the appropriate WAN interface, **WAN1** or **WAN2**.

Service Select the Service you want.

If the Service you need is not listed in the menu, click **Service Management** to add the new service. The *Service Management* screen appears.



```
All Traffic [TCP&UDP/1~65535]
Not Check Port [TCP&UDP/0~0]
DNS [UDP/53~53]
FTP [TCP/21~21]
HTTP [TCP/80~80]
HTTP Secondary [TCP/8080~8080]
HTTPS [TCP/443~443]
HTTPS Secondary [TCP/8443~8443]
TFTP [UDP/69~69]
IMAP [TCP/143~143]
NNTP [TCP/119~119]
POP3 [TCP/110~110]
SNMP [UDP/161~161]
SMTP [TCP/25~25]
TELNET [TCP/23~23]
```

Service Management

Service Name Enter a name.

Protocol Select the protocol it uses.

Port Range Enter its range.

Click **Add to List**. Click **Save Settings** to save your changes, or click **Cancel Changes** to undo them. Click **Exit** to return to the *Bandwidth Management* screen.

If you want to modify a service you have created, select it and click **Update this service**. Make changes. Click **Save Settings** to save your changes, or click **Cancel Changes** to undo them. Click **Exit** to return to the *Bandwidth Management* screen.

If you want to delete a service you have created, select it and click **Delete selected service**. Click **Save Settings** to save your changes, or click **Cancel Changes** to undo them. Click **Exit** to return to the *Bandwidth Management* screen.

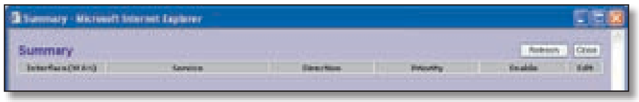
Direction Select **Upstream** for outbound traffic, or select **Downstream** for inbound traffic.

Priority Select **High**, **Middle**, or **Low**. High priority services will share 30% of the total system bandwidth. Middle priority services will share 60% of the total system bandwidth. Low priority services will share 10% of the total bandwidth. The default is **Middle**.

Enable Select **Enable** to use this Priority rule.

Click **Add to List**, and configure as many rules as you would like, up to a maximum of 50. To delete a rule, select it and click **Delete selected application**.

Click **Summary** to see a summary of the Priority rules. The *Summary* screen appears.



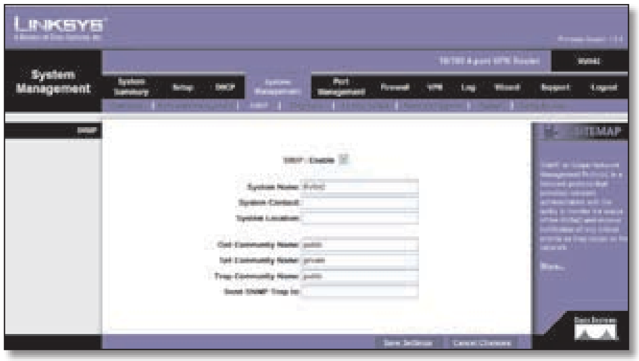
Summary (Priority Selected)

To change a rule, click **Edit**. To update the list, click **Refresh**. To return to the *Bandwidth Management* screen, click **Close**.

On the *Bandwidth Management* screen, click **Save Settings** to save your changes, or click **Cancel Changes** to undo them.

System Management > SNMP

SNMP, or Simple Network Management Protocol, is a network protocol that provides network administrators with the ability to monitor the status of the Router and receive notification of any critical events as they occur on the network. The Router supports SNMP v1/v2c and all relevant Management Information Base II (MIBII) groups. The appliance replies to SNMP Get commands for MIBII via any interface and supports a custom MIB for generating trap messages.



SNMP : Enable ☑

System Name: [illegible]

System Contact:

System Location:

Get Community Name: public

Set Community Name: private

Trap Community Name: public

Send SNMP Trap to:

System Management > SNMP

SNMP Enable SNMP is enabled by default. To disable the SNMP agent, click this option to remove the check mark.

System Name Set the hostname far the Router.

System Contact Enter the name of the network administrator who can be contacted with updates about the Router.

System Location Enter the network administrator's contact information: an e-mail address, telephone number, or pager number.

Get Community Name Create the name for a group or community of administrators who can view SNMP data. The default is **public**. A name of no more than 64 alphanumeric characters long must be entered.

Set Community Name Create the name for a group or community of administrators who can receive SNMP traps, messages regarding the Router's status. A name of no more than 64 alphanumeric characters long must be entered.

Trap Community Name Create the password that will be sent with each trap to the SNMP manager. A name of no more than 64 alphanumeric characters long must be entered.

Send SNMP Trap to Enter the IP address or domain name that should receive the traps sent by the Router.

Click **Save Settings** to save your changes, or click **Cancel Changes** to undo them.

System Management > Diagnostic

The Router has two built-in tools, DNS Name Lookup and Ping, which are used for troubleshooting network problems.

The Internet has a service called the Domain Name Service (DNS), which allows users to enter an easily remembered host name, such as www.linksys.com, instead of numerical TCP/IP addresses to access Internet resources. The DNS Name Lookup tool will return the numerical TCP/IP address of a host name.

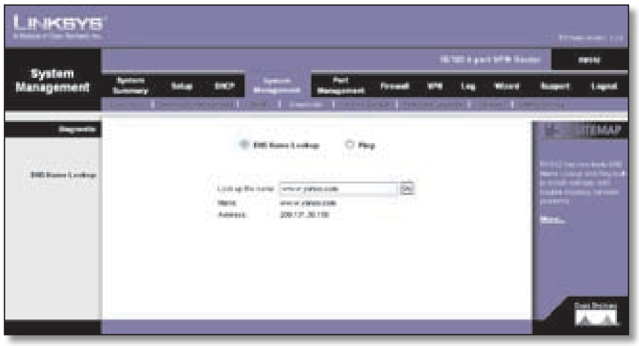
The ping test bounces a packet off a machine on the Internet back to the sender. This test shows if the Router is able to contact the remote host. If users on the LAN are having problems accessing services on the Internet, try pinging the DNS server or other machine at the ISP's location. If this test is successful, try pinging devices outside the ISP. This will show if the problem lies with the ISP's connection.

Diagnostic

DNS Name Lookup/Ping Select which tool you want to use, **DNS Name Lookup** or **Ping**. Then proceed to the appropriate instructions.

DNS Name Lookup

Before using this tool, make sure the IP address of the DNS server is entered on the *Setup > Network* screen; otherwise, this tool will not work.



● DNS Name Lookup ○ Ping

Look up the name: www.yahoo.com

Name: www.yahoo.com

Address: [illegible]

System Management > Diagnostic > DNS Name Lookup

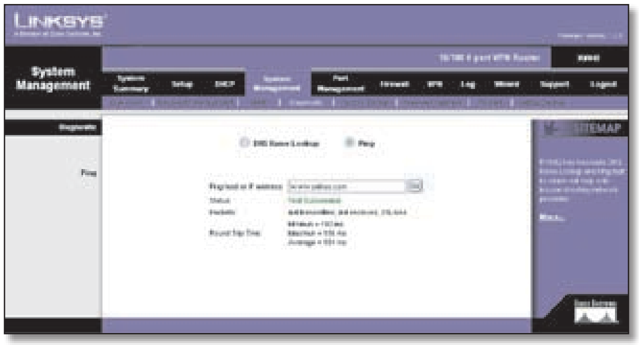
Look up the name Enter the host name, and click **Go**. (Do not add the prefix http:// or else you will get an error message.) The Router will then query the DNS server and display the results.

Name The host name is displayed.

Address The URL of the host is displayed.

Ping

Before using this tool make sure you know the device or host's IP address. If you do not know it, use the Router's DNS Name Lookup tool to find the IP address.



System Management > Diagnostic > Ping

Ping host or IP address Enter the IP address of the device being pinged, and click **Go**. The test will take a few seconds to complete. Then the Router will display the results.

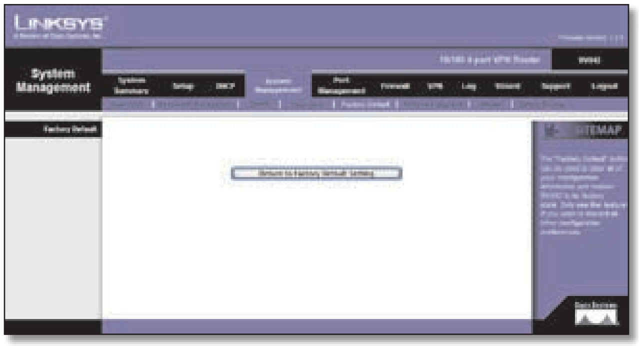
Status The status of the ping test is displayed.

Packets The number of packets transmitted, number of packets received, and percentage of packets lost are displayed.

Round Trip Time The minimum, maximum, and average round trip times are displayed.

System Management > Factory Default

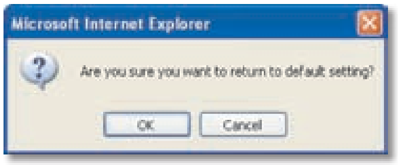
Use this screen to clear all of your configuration information and restore the Router to its factory default settings. Only use this feature if you wish to discard all the settings and preferences that you have configured.



System Management > Factory Default

Factory Default

Return to Factory Default Setting Click **Return to Factory Default Setting** if you want to restore the Router to its factory default settings. After clicking the button, a confirmation screen appears. Click **OK** to continue.



Microsoft Internet Explorer

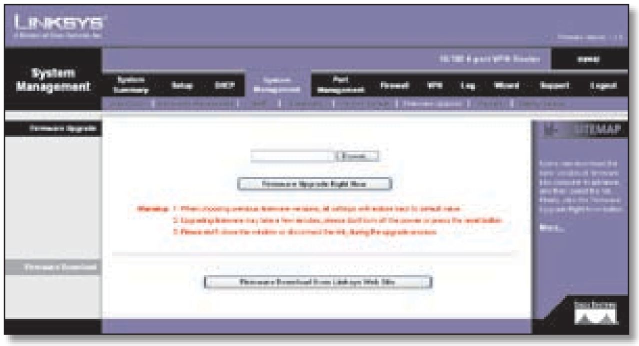
Are you sure you want to return to default setting?

OK Cancel

Factory Default Confirmation

System Management > Firmware Upgrade

You can use this feature to upgrade the Router's firmware to the latest version.



System Management > Firmware Upgrade

Firmware Upgrade

To download the firmware, refer to the Firmware Download instructions. If you have already downloaded the firmware onto your computer, then click the **Browse** button to look for the extracted file.

Firmware Upgrade Right Now After you have selected the extracted file, click **Firmware Upgrade Right Now**.

NOTE: The Router will take approximately ten minutes to upgrade its firmware. During this process, do not power off the Router or press the Reset button.

Firmware Download

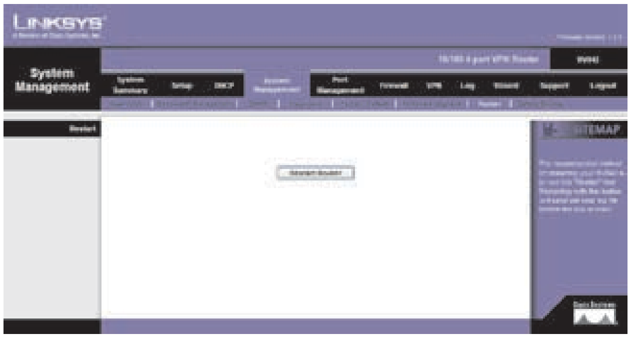
Firmware Download from Linksys Web Site If you need to download the latest version of the Router's firmware, click **Firmware Download from Linksys Web Site**. The Support page of the Linksys website appears.

Follow the on-screen instructions to access the Downloads page for the 10/100 4-Port VPN Router (model number: RV042). Then download the firmware upgrade file.

Extract the file on your computer. Then follow the Firmware Upgrade instructions.

System Management > Restart

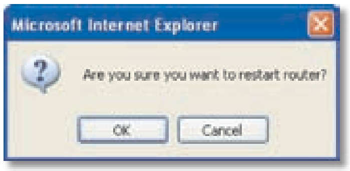
If you need to restart the Router, Linksys recommends that you use the Restart tool on this screen. When you restart from the *Restart* screen, then the Router will send out your log file before it is reset.



System Management > Restart

Restart

Restart Router Click **Restart Router** to restart the Router. After clicking the button, a confirmation screen appears. Click **OK** to continue.


Microsoft Internet Explorer

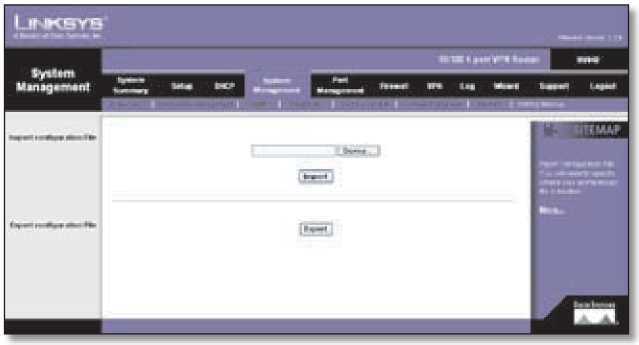
Are you sure you want to restart router?

Restart Confirmation

System Management > Setting Backup

This screen allows you to make a backup file of your preferences file for the Router. To save the backup file, you need to export the configuration file.

To use the backup preferences file, you need to import the configuration file that you previously exported.



System Management > Setting Backup

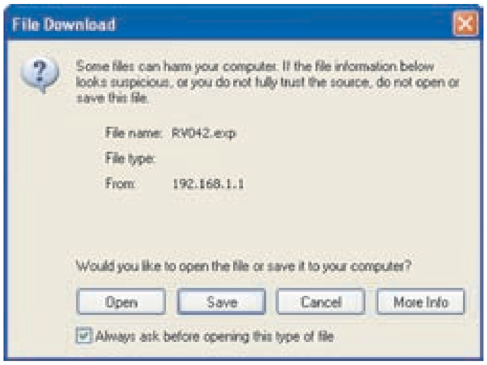
Import Configuration File

To import a configuration file, first specify where your backup preferences file is located. Click **Browse**, and then select the appropriate configuration file.

Import After you select the file, click **Import**. This process may take up to a minute. Then restart the Router so that the changes will take effect.

Export Configuration File

Export To export the Router's current configuration file, click **Export**.


File Download

Some files can harm your computer. If the file information below looks suspicious, or you do not fully trust the source, do not open or save this file.

File name: RV042.exp

File type:

From: 192.168.1.1

Would you like to open the file or save it to your computer?

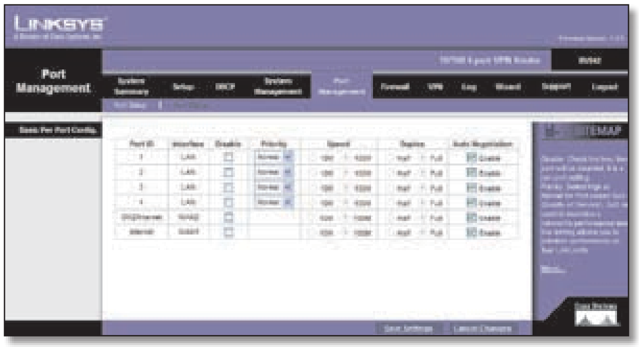
☑ Always ask before opening this type of file

File Download

Click **Save**, and then select the location where you want to store your backup preferences file. By default, this file will be called **RV042.exp**, but you may rename it if you wish. This process may take up to a minute.

Port Management > Port Setup

Configure the connection settings for each local port, such as priority, speed, and duplex. You can also enable or disable the auto-negotiation feature for all ports.



Port Management > Port Setup

Basic Per Port Config.

The Basic Per Port Config. table displays the following:

Port ID The port number or name is displayed.

Interface The port's interface type, LAN or WAN1/2, is displayed.

Disable To disable a port, select **Disable**.

Priority For port-based QoS, select the appropriate priority level, **High** or **Normal**.

Speed Select the port speed, **10M** or **100M**.

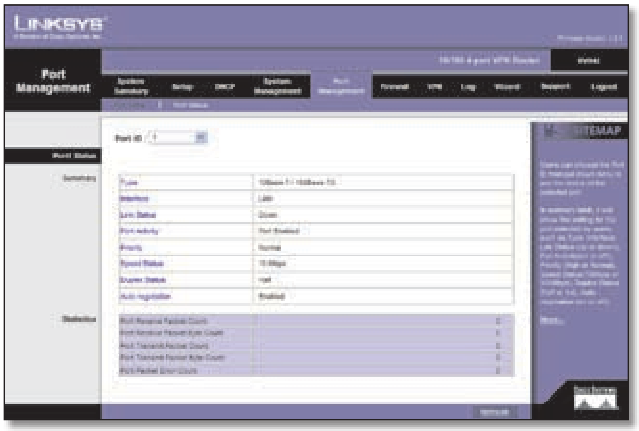
Duplex Select the duplex mode, **Half** or **Full**.

Auto Neg. Select **Enable** if you want the Router's ports to auto-negotiate connection speeds and duplex mode; then you will not need to set up speed and duplex settings separately.

Click **Save Settings** to save your changes, or click **Cancel Changes** to undo them.

Port Management > Port Status

Status information is displayed for the selected port.



Port Management > Port Status

Port ID To see the status information and settings for a specific port, select its ID number or name.

Port Status

Summary

For the selected port, the Summary table displays the following:

Type The port type is displayed.

Interface The interface type, LAN or WAN, is displayed.

Link Status The status of the connection is displayed.

Port Activity The status of the port is displayed.

Speed Status The speed of the port, 10 Mbps, or 100 Mbps, is displayed.

Duplex Status The duplex mode is displayed, Half or Full.

Auto negotiation The status of the feature is displayed.

Statistics

For the selected port, the Statistics table displays the following:

Port Receive Packet Count The number of packets received is displayed.

Port Receive Packet Byte Count The number of packet bytes received is displayed.

Port Transmit Packet Count The number of packets transmitted is displayed.

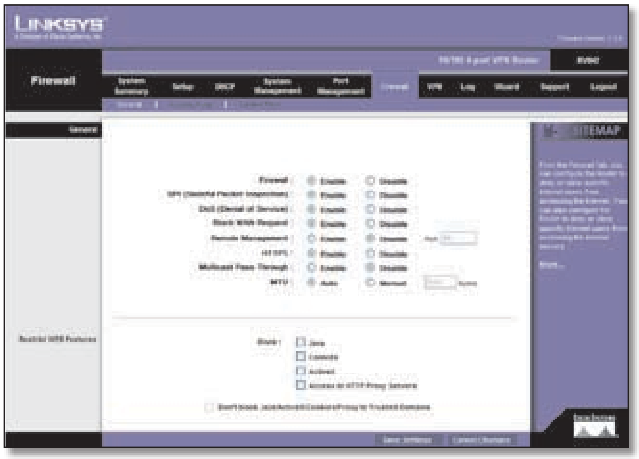
Port Transmit Packet Byte Count The number of packet bytes transmitted is displayed.

Port Packet Error Count The number of packet errors is displayed.

To update the on-screen information, click **Refresh**.

Firewall > General

Enable or disable a variety of firewall, security, and web features.



Firewall > General

General

Firewall The firewall is enabled by default. If you disable it, then the SPI, DoS, and Block WAN Request features, Access Rules, and Content Filters will also be disabled, and the Remote Management feature will be enabled.

SPI (Stateful Packet Inspection) This option is enabled by default. The Router's firewall uses Stateful Packet Inspection to review the information that passes through the firewall. It inspects all packets based on the established connection, prior to passing the packets for processing through a higher protocol layer.

DoS (Denial of Service) This option is enabled by default. It protects internal networks from Internet attacks, such as SYN Flooding, Smurf, LAND, Ping of Death, IP Spoofing, and reassembly attacks.

Block WAN Request This option is enabled by default. Using this feature, the Router drops both unaccepted TCP request and ICMP packets from the WAN side. Hackers will not find the Router by pinging the WAN IP address.

Remote Management This option is disabled by default. If you want to manage the Router through a WAN connection, first change the password on the *Setup > Password* screen (this prevents any user from accessing the Router with the default password). Then select **Enable** for the Remote Management setting, and enter the port number (port **80**, the default, or 8080 is usually used).

> **NOTE:** If the Remote Management feature on the *Firewall > General* screen has been enabled, then users with administrative privileges can remotely access the web-based utility. Use **http://<WAN IP address of the Router>**, or use **https://<WAN IP address of the Router>** if you have enabled the HTTPS feature.

HTTPS HTTPS is a secured HTTP session. If Remote Management is enabled, HTTPS is enabled by default.

> **NOTE:** If you disable the HTTPS feature, then you also disable the Linksys QuickVPN service on the Router.

Multicast Pass Through This option is disabled by default. IP multicasting occurs when a single data transmission is sent to multiple recipients at the same time. Using this feature, the Router allows IP multicast packets to be forwarded to the appropriate LAN devices. Multicast Pass Through is used for Internet games, videoconferencing, and multimedia applications.

MTU (Maximum Transmission Unit) This setting specifies the largest packet size permitted for network transmission. In most cases, keep the default, **Auto**. To specify the MTU, select **Manual**, and then enter the maximum MTU size.

Restrict WEB Features

Block Select the filters you want to use.

- **Java** Java is a programming language for websites. If you deny Java applets, you run the risk of losing access to Internet sites created using this programming language. To block Java applets, select **Java**.
- **Cookies** A cookie is data stored on your PC and used by Internet sites when you interact with them. To block cookies, select **Cookies**.
- **ActiveX** ActiveX is a programming language for websites. If you deny ActiveX, you run the risk of losing access to Internet sites created using this programming language. To block ActiveX, select **ActiveX**.
- **Access to HTTP Proxy Servers** Use of WAN proxy servers may compromise the Router's security. If you block access to HTTP proxy servers, then you block access to WAN proxy servers. To block access, select **Access to HTTP Proxy Servers**.

Don't block Java/ActiveX/Cookies/Proxy to Trusted Domains To keep trusted sites unblocked, select this option. You will be able to specify a list of trusted domains.

Click **Save Settings** to save your changes, or click **Cancel Changes** to undo them.

Firewall > Access Rules

Access rules evaluate network traffic to decide whether or not it is allowed to pass through the Router's firewall. Access Rules look specifically at a data transmission's source IP address, destination IP address, and IP protocol type, and you can apply each access rule according to a different schedule.

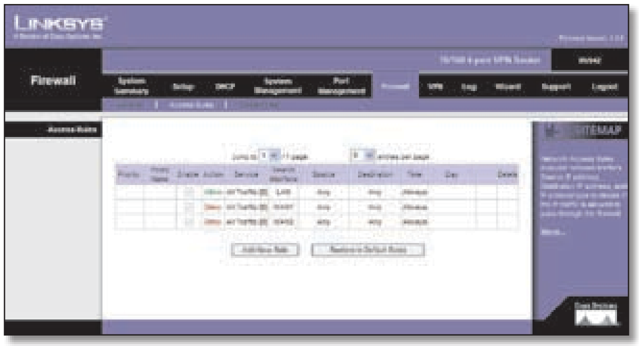
With the use of custom rules, it is possible to disable all firewall protection or block all access to the Internet, so use extreme caution when creating or deleting access rules.

The Router has the following default rules:

- All traffic from the LAN to the WAN is allowed.
- All traffic from the WAN to the LAN is denied.
- All traffic from the LAN to the DMZ is allowed.
- All traffic from the DMZ to the LAN is denied.
- All traffic from the WAN to the DMZ is allowed.
- All traffic from the DMZ to the WAN is allowed.

Custom rules can be created to override the above default rules, but there are four additional default rules that will be always active and cannot be overridden by any custom rules.

- HTTP service from the LAN to the Router is always allowed.
- DHCP service from the LAN is always allowed.
- DNS service from the LAN is always allowed.
- Ping service from the LAN to the Router is always allowed.



Firewall > Access Rules

Access Rules

Except for the default rules, all configured access rules are listed in the Access Rules table, and you can set the priority for each custom rule.

If the Access Rules table has multiple pages, select a different page to view from the *Jump to* drop-down menu. If you want more or fewer entries listed per page, select a different number from the *entries per page* drop-down menu.

For each access rule, the Access Rules table lists the following:

Priority The priority of the access rule is displayed, 1 indicating the highest priority. To change its priority, select a different priority from the drop-down menu. (When an access rule is created, the Router automatically assigns a priority; however, you can change the priority after the rule is created.) If there is a conflict between two access rules, then the higher priority rule takes precedence. The default access rules have the lowest priority.

Policy Name The name of the access rule is displayed.

Enable The status of the access rule is displayed. To enable or disable a rule, click the **Enable** check box.

Action The Action, Allow or Deny, is displayed.

Service The Service is displayed.

Source Interface The Source Interface, LAN or WAN1/2, is displayed.

Source The specific Source is displayed.

Destination The specific Destination is displayed.

Time The time interval to which the access rule applies is displayed.

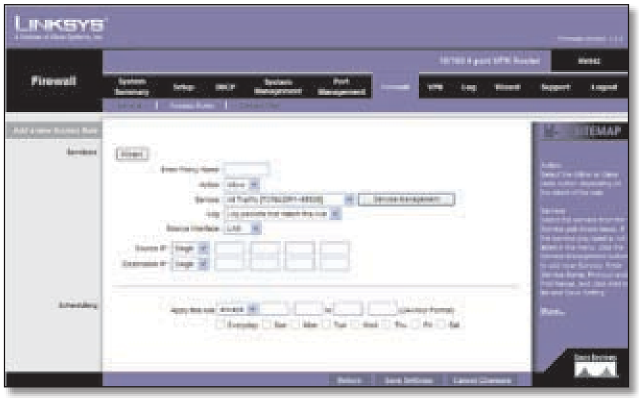
Day The days to which the access rule applies is displayed.

Click **Edit** to edit an access rule, or click the **Trash Can** icon to delete an access rule.

Click **Add New Rule** to add new access rules, and the *Add a New Access Rule* screen appears.

Click the **Restore to Default Rules** to restore the default rules and delete the custom access rules.

Add a New Access Rule



Add a New Access Rule

Services

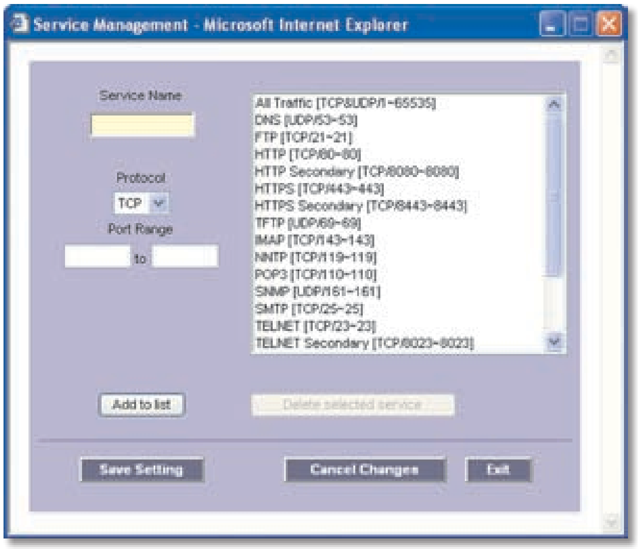
Wizard If you need help to configure the access rules, click **Wizard**, and follow the on-screen instructions. For additional information, refer to the "Wizard" section of this chapter.

Enter Policy Name Enter a name for the new access rule.

Action Select **Allow** or **Deny**, depending on the purpose of the access rule.

Service Select the Service you want.

If the Service you need is not listed in the menu, click **Service Management** to add the new service. The *Service Management* screen appears.



Service Management - Microsoft Internet Explorer

Service Name

Protocol: TCP

Port Range ___ to ___

All Traffic [TCP&UDP/1~65535]
DNS [UDP/53~53]
FTP [TCP/21~21]
HTTP [TCP/80~80]
HTTP Secondary [TCP/8080~8080]
HTTPS [TCP/443~443]
HTTPS Secondary [TCP/8443~8443]
TFTP [UDP/69~69]
IMAP [TCP/143~143]
NNTP [TCP/119~119]
POP3 [TCP/110~110]
SNMP [UDP/161~161]
SMTP [TCP/25~25]
TELNET [TCP/23~23]
TELNET Secondary [TCP/8023~8023]

Service Management

Service Name Enter a name.

Protocol Select the protocol it uses.

Port Range Enter its range.

Click **Add to List**. Click **Save Settings** to save your changes, or click **Cancel Changes** to undo them. Click **Exit** to return to the *Add a New Access Rule* screen.

If you want to modify a service you have created, select it and click **Update this service**. Make changes. Click **Save Settings** to save your changes, or click **Cancel Changes** to undo them. Click **Exit** to return to the *Add a New Access Rule* screen.

If you want to delete a service you have created, select it and click **Delete selected service**. Click **Save Settings** to save your changes, or click **Cancel Changes** to undo them. Click **Exit** to return to the *Add a New Access Rule* screen.

Log The Router can keep a log tracking this type of activity. To keep a log, select **Log packets match this access rule**. If you do not want a log, select **Do Not Log these packets**.

> **NOTE:** If the Deny Policies option is enabled on the *Log > System Log* screen, then the log will not include log events from the Deny access rules on the *Firewall > Access Rules* screen. Log events from the Deny access rules will be logged separately from Deny Policies if the option, Log packets match this rule, is selected.
>
> If the Allow Policies option is enabled on the *Log > System Log* screen, then the log will include log events from the Allow access rules on the *Firewall > Access Rules* screen, regardless of the option, Log packets match this rule.

Source Interface Select **WAN1**, **WAN2**, **LAN**, or **Any**.

Source Select the Source IP address(es) for the access rule. If it can be any IP address, select **Any**. If it is one IP address, select **Single** and enter the IP address. If it is a range of IP addresses, select **Range**, and enter the starting and ending IP addresses in the fields provided.

Destination Select the Destination IP address(es) for the access rule. If it can be any IP address, select **Any**. If it is one IP address, select **Single** and enter the IP address. If it is a range of IP addresses, select **Range**, and enter the starting and ending IP addresses in the fields provided.

Scheduling

Apply this rule Decide when you want the access rule to be enforced. To specify days of the week, select **24 Hr**, and then select the appropriate days.

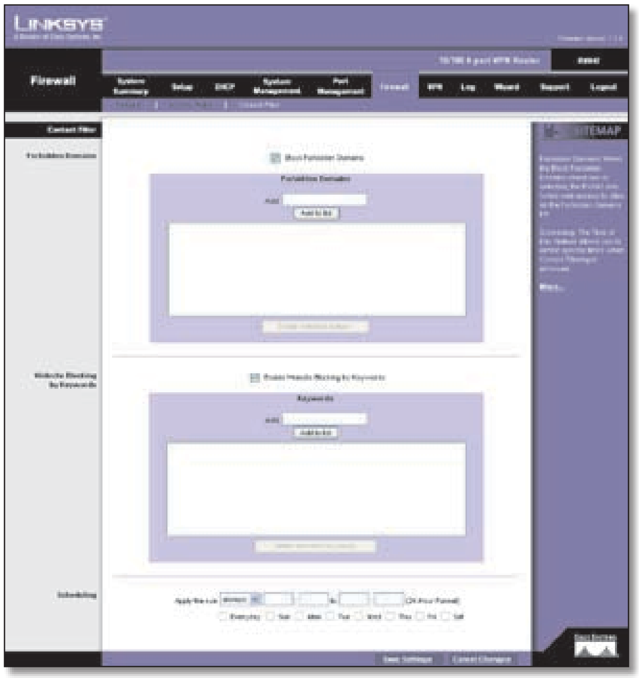
To specify specific hours, select **from**, and enter the specific hours and minutes in 24-hour format. Then select the appropriate days.

The default for any new rule is to **always** enforce it.

Click **Save Settings** to save your changes, or click **Cancel Changes** to undo them. Click **Return** to return to the *Access Rules* screen.

Firewall > Content Filter

Use this screen to block specific domains during the designated days and times for specific devices.



Firewall > Content Filter

Content Filter

Forbidden Domains

Block Forbidden Domains To block access to the websites on the Forbidden Domains list, select this option.

Add Enter the domain you want to block.

To add a domain to the list, click **Add to list**. To remove a domain from the list, select the entry, and click the **Delete selected domain**.

Website Blocking by Keywords

Enable Website Blocking by Keywords To block access to websites using the keywords on the Website Blocking by Keywords list, select this option.

Add Enter the keyword you want to block.

To add a keyword to the list, click **Add to list**. To remove a domain from the list, select the entry, and click the **Delete selected keywords**.

Scheduling Decide when you want the content filters rules to be enforced. To specify specific hours, select **from**, and enter the specific hours and minutes in 24-hour format. Then select the appropriate days.

The default is to **always** enforce it.

Click **Save Settings** to save your changes, or click **Cancel Changes** to undo them.

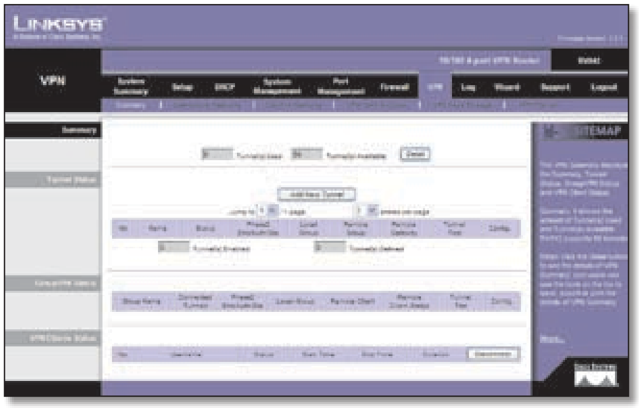
NOTE: The content filter rules will be automatically disabled if the Trend Micro ProtectLink service is activated on the Router.

ProtectLink

For information about the ProtectLink tab, refer to "Appendix G: Trend Micro ProtectLink Gateway Service".

VPN > Summary

This screen displays general information about the Router's VPN tunnel settings. The Router supports up to 50 tunnels.



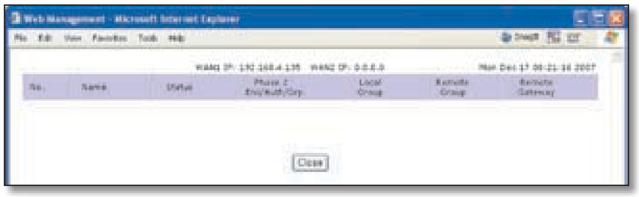
VPN > Summary

Summary

Tunnel Used The number of VPN tunnels being used is displayed.

Tunnel Available The number of available VPN tunnels is displayed.

Detail Click **Detail** for more information.



VPN Summary Details

The WAN1 IP address and WAN2 IP address will be displayed.

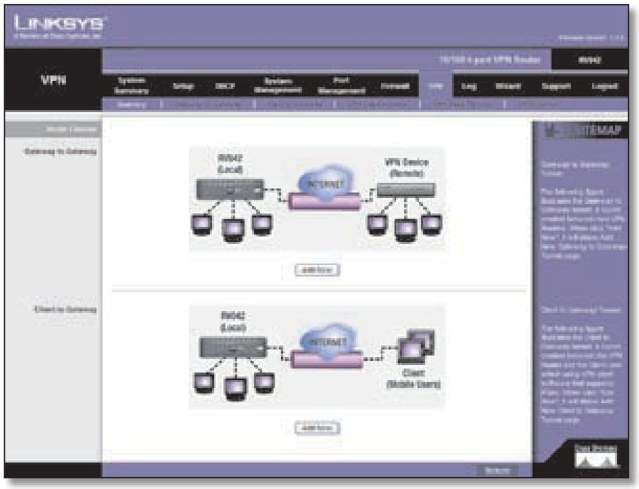
For each VPN tunnel, the No., Name, Status, Phase 2 Enc/Auth/Grp, Local Group, Remote Group, and Remote Gateway will be displayed.

For each group VPN, the Group Name, number of Connected Tunnels, Phase 2 Encrypt/Auth/Group, Local Group, and Remote Client will be displayed.

Click **Close** to exit this screen and return to the *Summary* screen.

Tunnel Status

Add New Tunnel Click **Add New Tunnel** to add a VPN tunnel. The *Mode Choose* screen appears.



Mode Choose

Gateway to Gateway

To create a tunnel between two VPN devices, such as two VPN Routers, click **Add Now**. The *Gateway to Gateway* screen appears. Proceed to the "VPN > Gateway to Gateway" section for instructions. Click **Return** to return to the *Summary* screen.

Client to Gateway

To create a tunnel between the VPN Router and the client using VPN client software that supports IPSec, click **Add Now**. The *Client to Gateway* screen appears. Proceed to the "VPN > Client to Gateway" section for instructions. Click **Return** to return to the *Summary* screen.

If the VPN Summary table has multiple pages, select a different page to view from the *Jump to* drop-down menu. If you want more or fewer entries listed per page, select a different number from the *entries per page* drop-down menu.

After you have added the VPN tunnel, you will see it listed in the table.

No. It shows the number of the VPN tunnel.

Name It shows the Tunnel Name that you gave the VPN tunnel.

Status This indicates the status of the VPN tunnel.

Phase2 Enc/Auth/Grp This shows the Phase 2 Encryption type (NULL/DES/3DES/AES-128/AES-192/AES-256), Authentication method (NULL/MD5/SHA1), and DH Group number (1/2/5) that you chose in the IPSec Setup section.

If you selected Manual for the Keying Mode in the IPSec section, then only the Encryption type and Authentication method will be displayed.

Local Group This shows the IP address and subnet mask of the Local Group.

Remote Group The IP address and subnet mask of the Remote Group are displayed here.

Remote Gateway It shows the IP address of the Remote Gateway.

Tunnel Test Click **Connect** to verify the status of the VPN tunnel. The test result will be updated in the Status column. If the tunnel is connected, a Disconnect button will be available so you can end the connection.

Config. Click **Edit** to open a new screen where you can change the tunnel's settings. Refer to the "Gateway to Gateway" or "Client to Gateway" section for more information. Click the **Trash Can** icon to delete all of your tunnel settings for each individual tunnel.

Tunnel Enabled The number of enabled VPN tunnels is displayed.

Tunnel Defined The number of defined VPN tunnels is displayed.

GroupVPN Status

If you do not enable the GroupVPN setting for any of your Client to Gateway tunnels, then this section will be blank.

Group Name This shows the name you entered when you created the Client to Gateway tunnel.

Connected Tunnels This shows the number of users logged into the group VPN.

Phase2 Enc/Auth/Grp This shows the Phase 2 Encryption type (NULL/DES/3DES/AES-128/AES-192/AES-256), Authentication method (NULL/MD5/SHA1), and DH Group number (1/2/5) that you chose in the IPSec Setup section.

Local Group This shows the IP address and subnet mask of the Local Group.

Remote Client This shows the remote clients in the group VPN.

Remote Clients Status Click **Detail List** to display the Group Name, IP address and Connection Time of this group VPN. Click **Refresh** to update the on-screen information. Click **Close** to exit this screen and return to the *Summary* screen.

Tunnel Test Click **Connect** to verify the status of the group VPN. The test result will be updated in the Status column. If the group VPN is connected, a Disconnect button will be available so you can end the connection.

Config. Click **Edit** to open a new screen where you can change the tunnel's settings. Refer to the "Client to Gateway" section for more information. Click the **Trash Can** icon to delete all of your settings for each individual group VPN.

VPN Clients Status

This section identifies the VPN clients currently connected to the Router.

No. It shows the number of the VPN client.

Username It shows the name of the VPN client.

Status This indicates the status of the VPN client connection.

Start Time This shows the time when the VPN client established its VPN connection to the Router.

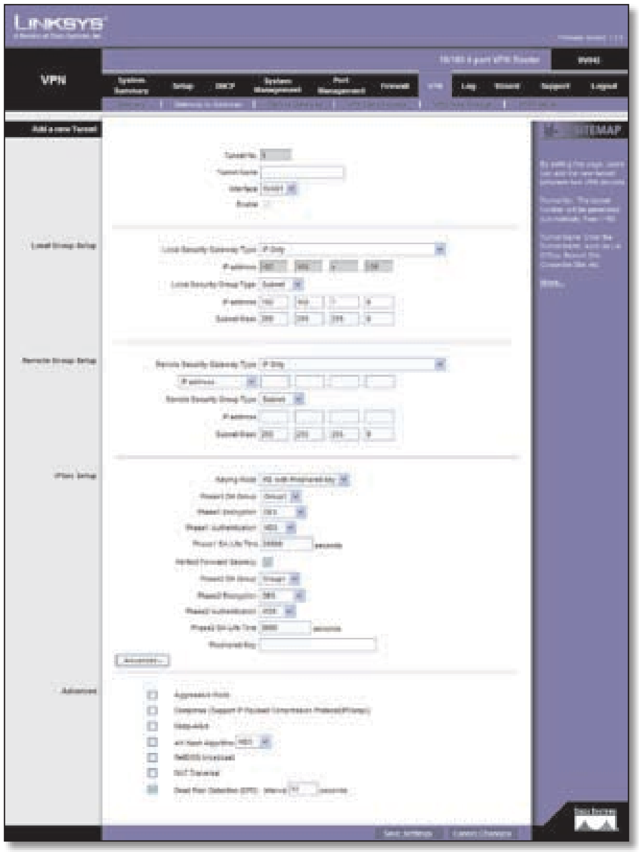
End Time This shows the time when the VPN client ended its VPN connection to the Router.

Duration This shows how long the VPN connection existed.

To disconnect any VPN client, select the VPN client in the Disconnect column, and then click **Disconnect**.

VPN > Gateway to Gateway

Use this screen to create a new tunnel between two VPN devices.



VPN > Gateway to Gateway

Add a New Tunnel

Tunnel No The tunnel number is automatically generated.

Tunnel Name Enter a name for this VPN tunnel, such as Los Angeles Office, Chicago Branch, or New York Division. This allows you to identify multiple tunnels and does not have to match the name used at the other end of the tunnel.

Interface Select the appropriate WAN port, **WAN1** or **WAN2** (available if the Dual WAN feature is enabled).

Enable Check this box to enable a VPN tunnel. (When you create a VPN tunnel, this check box will be disabled.)

Local Group Setup

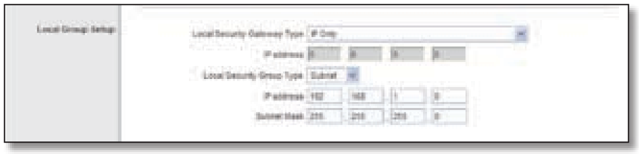
Local Security Gateway Type

Select the type you want to use: **IP Only**, **IP + Domain Name(FQDN) Authentication**, **IP + E-mail Addr.(USER FQDN) Authentication**, **Dynamic IP + Domain Name(FQDN) Authentication**, or **Dynamic IP + E-mail Addr.(USER FQDN) Authentication**. Follow the instructions for the type you want to use.

NOTE: The Local Security Gateway Type you select should match the Remote Security Gateway Type selected on the VPN device at the other end of the tunnel.

IP Only

The default is **IP Only**. Only the device with a specific IP address will be able to access the tunnel.



Local Group Setup

Local Security Gateway Type: IP Only

IP address: 0 . 0 . 0 . 0

Local Security Group Type: Subnet

IP address: 192 . 168 . 1 . 0

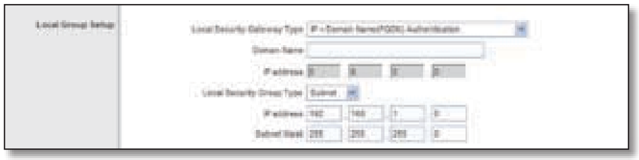
Subnet Mask: 255 . 255 . 255 . 0

Local Security Gateway Type > IP Only

IP address The WAN (or Internet) IP address of the Router automatically appears.

IP + Domain Name(FQDN) Authentication

The IP address and FQDN must match the Remote Security Gateway of the remote VPN device, and they can only be used for one tunnel connection.



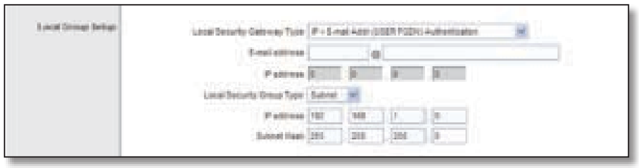
Local Group Setup
Local Security Gateway Type: IP + Domain Name(FQDN) Authentication
Domain Name:
IP address: 0 . 0 . 0 . 0
Local Security Group Type: Subnet
IP address: 192 . 168 . 1 . 0
Subnet Mask: 255 . 255 . 255 . 0

Local Security Gateway Type > IP + Domain Name(FQDN) Authentication

Domain Name The Fully Qualified Domain Name (FQDN) is the host name and domain name for a specific computer on the Internet. Enter the FQDN of the Router.

IP address The WAN (or Internet) IP address of the Router automatically appears.

IP + E-mail Addr.(USER FQDN) Authentication



Local Group Setup
Local Security Gateway Type: IP + E-mail Addr.(USER FQDN) Authentication
E-mail address: @
IP address: 0 . 0 . 0 . 0
Local Security Group Type: Subnet
IP address: 192 . 168 . 1 . 0
Subnet Mask: 255 . 255 . 255 . 0

Local Security Gateway Type > IP + E-mail Addr.(USER FQDN) Authentication

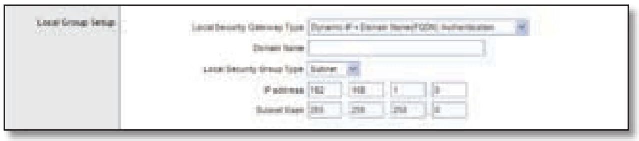
E-mail address Enter the e-mail address for authentication.

IP address The WAN (or Internet) IP address of the Router automatically appears.

Dynamic IP + Domain Name(FQDN) Authentication

The Local Security Gateway will be a dynamic IP address, so you do not need to enter the IP address. When the Remote Security Gateway requests to create a tunnel with the Router, the Router will work as a responder.

The domain name must match the Remote Security Gateway of the remote VPN device and can only be used for one tunnel connection.



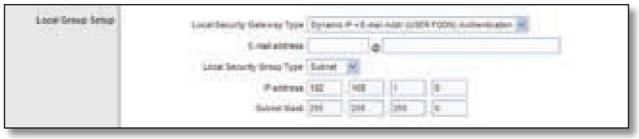
Local Group Setup
Local Security Gateway Type: Dynamic IP + Domain Name(FQDN) Authentication
Domain Name:
Local Security Group Type: Subnet
IP address: 192 . 168 . 1 . 0
Subnet Mask: 255 . 255 . 255 . 0

Local Security Gateway Type > Dynamic IP + Domain Name(FQDN) Authentication

Domain Name Enter the domain name for authentication. (Once used, you cannot use it again to create a new tunnel connection.)

Dynamic IP + E-mail Addr.(USER FQDN) Authentication

The Local Security Gateway will be a dynamic IP address, so you do not need to enter the IP address. When the Remote Security Gateway requests to create a tunnel with the Router, the Router will work as a responder.



Local Group Setup
Local Security Gateway Type: Dynamic IP + E-mail Addr.(USER FQDN) Authentication
E-mail address: @
Local Security Group Type: Subnet
IP address: 192 . 168 . 1 . 0
Subnet Mask: 255 . 255 . 255 . 0

Local Security Gateway Type > Dynamic IP + E-mail Addr.(USER FQDN) Authentication

E-mail address Enter the e-mail address for authentication.

Local Security Group Type

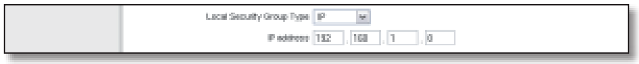
Select the local LAN user(s) behind the Router that can use this VPN tunnel. Select the type you want to use: **IP**, **Subnet**, or **IP Range**. Follow the instructions for the type you want to use.

NOTE: The Local Security Group Type you select should match the Remote Security Group Type selected on the VPN device at the other end of the tunnel.

After you have selected the Local Security Group Type, the settings available on this screen may change, depending on which selection you have made.

IP

Only the computer with a specific IP address will be able to access the tunnel.



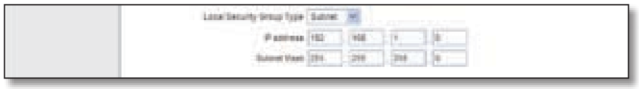
Local Security Group Type: IP
IP address: 192 . 168 . 1 . 0

Local Security Group Type > IP

IP address Enter the appropriate IP address. The default IP is **192.168.1.0**.

Subnet

The default is **Subnet**. All computers on the local subnet will be able to access the tunnel.



Local Security Group Type: Subnet
IP address: 192 . 168 . 1 . 0
Subnet Mask: 255 . 255 . 255 . 0

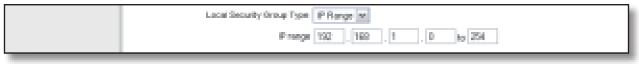
Local Security Group Type > Subnet

IP address Enter the IP address. The default is **192.168.1.0**.

Subnet Mask Enter the subnet mask. The default is **255.255.255.0**.

IP Range

Specify a range of IP addresses within a subnet that will be able to access the tunnel.



Local Security Group Type: IP Range
IP range: 192 . 168 . 1 . 0 to 254

Local Security Group Type > IP Range

IP range Enter the range of IP addresses. The default is **192.168.1.0~254**.

Remote Group Setup

Before you configure the Remote Group Setup, make sure your VPN tunnel will have two different IP subnets. For example, if the local VPN Router has an IP scheme of 192.168.1.x (x being a number from 1 to 254), then the remote VPN router should have a different IP scheme, such as 192.168.2.y (y being a number from 1 to 254). Otherwise, the IP addresses will conflict, and the VPN tunnel cannot be created.

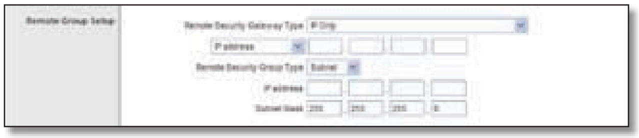
Remote Security Gateway Type

Select the type you want to use: **IP Only**, **IP + Domain Name(FQDN) Authentication**, **IP + E-mail Addr.(USER FQDN) Authentication**, **Dynamic IP + Domain Name(FQDN) Authentication**, or **Dynamic IP + E-mail Addr.(USER FQDN) Authentication**. Follow the instructions for the type you want to use.

NOTE: The Remote Security Gateway Type you select should match the Local Security Gateway Type selected on the VPN device at the other end of the tunnel.

IP Only

The default is **IP Only**. Only the device with a specific IP address will be able to access the tunnel. Select **IP address** or **IP by DNS Resolved**.



Remote Group Setup
Remote Security Gateway Type: IP Only
IP address
Remote Security Group Type: Subnet
IP address
Subnet Mask: 255 . 255 . 255 . 0

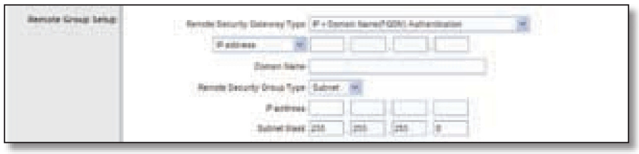
Remote Security Gateway Type > IP Only

IP address Select this option if you know the static IP address of the remote VPN device at the other end of the tunnel, and then enter the IP address.

IP by DNS Resolved Select this option if you do not know the static IP address of the remote VPN device but you do know its domain name. Then enter the remote VPN device's domain name on the Internet. The Router will retrieve the IP address of the remote VPN device via its public DNS records.

IP + Domain Name(FQDN) Authentication

The IP address and domain name ID must match the Local Gateway of the remote VPN device, and they can only be used for one tunnel connection.



Remote Group Setup
Remote Security Gateway Type: IP + Domain Name(FQDN) Authentication
IP address
Domain Name
Remote Security Group Type: Subnet
IP address
Subnet Mask: 255 . 255 . 255 . 0

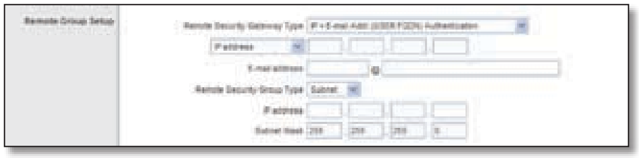
Remote Security Gateway Type > IP + Domain Name(FQDN) Authentication

IP address Select this option if you know the static IP address of the remote VPN device at the other end of the tunnel, and then enter the IP address.

IP by DNS Resolved Select this option if you do not know the static IP address of the remote VPN device but you do know its domain name. Then enter the remote VPN device's domain name on the Internet. The Router will retrieve the IP address of the remote VPN device via its public DNS records.

Domain Name Enter the domain name as an ID (it cannot be a real domain name on the Internet).

IP + E-mail Addr.(USER FQDN) Authentication



Remote Group Setup
Remote Security Gateway Type: IP + E-mail Addr.(USER FQDN) Authentication
IP address
E-mail address: @
Remote Security Group Type: Subnet
IP address
Subnet Mask: 255 . 255 . 255 . 0

Remote Security Gateway Type > IP + E-mail Addr.(USER FQDN) Authentication

IP address Select this option if you know the static IP address of the remote VPN device at the other end of the tunnel, and then enter the IP address.

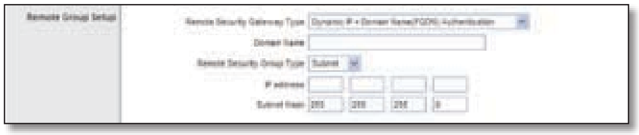
IP by DNS Resolved Select this option if you do not know the static IP address of the remote VPN device but you do know its domain name. Then enter the remote VPN device's domain name on the Internet. The Router will retrieve the IP address of the remote VPN device via its public DNS records.

E-mail address Enter the e-mail address as an ID.

Dynamic IP + Domain Name(FQDN) Authentication

The Local Security Gateway will be a dynamic IP address, so you do not need to enter the IP address. When the Remote Security Gateway requests to create a tunnel with the Router, the Router will work as a responder.

The domain name must match the Local Gateway of the remote VPN device and can only be used for one tunnel connection.



Remote Group Setup

Remote Security Gateway Type: Dynamic IP + Domain Name(FQDN) Authentication

Domain Name:

Remote Security Group Type: Subnet

IP address:

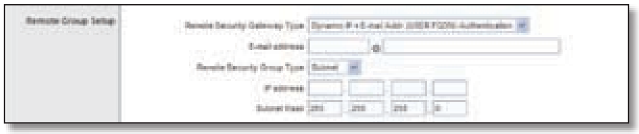
Subnet Mask: 255 . 255 . 255 . 0

Remote Security Gateway Type > Dynamic IP + Domain Name(FQDN) Authentication

Domain Name Enter the domain name for authentication. (Once used, you cannot use it again to create a new tunnel connection.)

Dynamic IP + E-mail Addr.(USER FQDN) Authentication

The Remote Security Gateway will be a dynamic IP address, so you do not need to enter the IP address. When the Remote Security Gateway requests to create a tunnel with the Router, the Router will work as a responder.



Remote Group Setup

Remote Security Gateway Type: Dynamic IP + E-mail Addr.(USER FQDN) Authentication

E-mail address: @

Remote Security Group Type: Subnet

IP address:

Subnet Mask: 255 . 255 . 255 . 0

Remote Security Gateway Type > Dynamic IP + E-mail Addr.(USER FQDN) Authentication

E-mail address Enter the e-mail address for authentication.

Remote Security Group Type

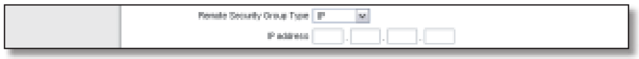
Select the Remote Security Group behind the Remote Gateway that can use this VPN tunnel. Select the type you want to use: **IP**, **Subnet**, or **IP Range**. Follow the instructions for the type you want to use.

NOTE: The Remote Security Group Type you select should match the Local Security Group Type selected on the VPN device at the other end of the tunnel.

After you have selected the Remote Security Group Type, the settings available on this screen may change, depending on which selection you have made.

IP

Only the computer with a specific IP address will be able to access the tunnel.



Remote Security Group Type: IP

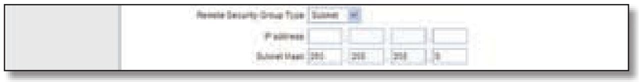
IP address: . . .

Remote Security Group Type > IP

IP address Enter the appropriate IP address.

Subnet

The default is **Subnet**. All computers on the remote subnet will be able to access the tunnel.



Remote Security Group Type: Subnet

IP address:

Subnet Mask: 255 . 255 . 255 . 0

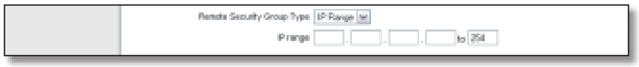
Remote Security Group Type > Subnet

IP address Enter the IP address.

Subnet Mask Enter the subnet mask. The default is **255.255.255.0**.

IP Range

Specify a range of IP addresses within a subnet that will be able to access the tunnel.



Remote Security Group Type: IP Range

IP range: . . . to 254

Remote Security Group Type > IP Range

IP range Enter the range of IP addresses.

IPSec Setup

In order for any encryption to occur, the two ends of a VPN tunnel must agree on the methods of encryption, decryption, and authentication. This is done by sharing a key to the encryption code. For key management, the default mode is **IKE with Preshared Key**.

Keying Mode Select **IKE with Preshared Key** or **Manual**. Both ends of a VPN tunnel must use the same mode of key management. After you have selected the mode, the settings available on this screen may change, depending on the selection you have made. Follow the instructions for the mode you want to use.

IKE with Preshared Key

IKE is an Internet Key Exchange protocol used to negotiate key material for Security Association (SA). IKE uses the Preshared Key to authenticate the remote IKE peer.

Phase 1 DH Group Phase 1 is used to create the SA. DH (Diffie-Hellman) is a key exchange protocol used during Phase 1 of the authentication process to establish pre-shared keys. There are three groups of different prime key lengths. Group 1 is 768 bits, and Group 2 is 1,024 bits. Group 5 is 1,536 bits. If network speed is preferred, select **Group 1**. If network security is preferred, select **Group 5**.

Phase 1 Encryption Select a method of encryption: **DES** (56-bit), **3DES** (168-bit), **AES-128** (128-bit), **AES-192** (192-bit), or **AES-256** (256-bit). The method determines the length of the key used to encrypt or decrypt ESP packets. AES-256 is recommended because it is the most secure. Make sure both ends of the VPN tunnel use the same encryption method.

Phase 1 Authentication Select a method of authentication, **MD5** or **SHA**. The authentication method determines how the ESP packets are validated. MD5 is a one-way hashing algorithm that produces a 128-bit digest. SHA is a one-way hashing algorithm that produces a 160-bit digest. SHA is recommended because it is more secure. Make sure both ends of the VPN tunnel use the same authentication method.

Phase 1 SA Life Time Configure the length of time a VPN tunnel is active in Phase 1. The default value is **28800** seconds.

Perfect Forward Secrecy If the Perfect Forward Secrecy (PFS) feature is enabled, IKE Phase 2 negotiation will generate new key material for IP traffic encryption and authentication, so hackers using brute force to break encryption keys will not be able to obtain future IPSec keys.

Phase 2 DH Group If the Perfect Forward Secrecy feature is disabled, then no new keys will be generated, so you do not need to set the Phase 2 DH Group (the key for Phase 2 will match the key in Phase 1).

There are three groups of different prime key lengths. Group 1 is 768 bits, and Group 2 is 1,024 bits. Group 5 is 1,536 bits. If network speed is preferred, select **Group 1**. If network security is preferred, select **Group 5**. You do not have to use the same DH Group that you used for Phase 1.

Phase 2 Encryption Phase 2 is used to create one or more IPSec SAs, which are then used to key IPSec sessions. Select a method of encryption: **NULL**, **DES** (56-bit), **3DES** (168-bit), **AES-128** (128-bit), **AES-192** (192-bit), or **AES-256** (256-bit). It determines the length of the key used to encrypt or decrypt ESP packets. AES-256 is recommended because it is the most secure. Both ends of the VPN tunnel must use the same Phase 2 Encryption setting.

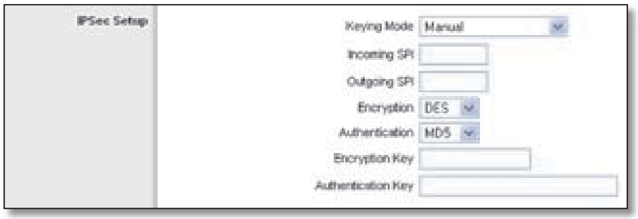
Phase 2 Authentication Select a method of authentication, **NULL**, **MD5**, or **SHA**. The authentication method determines how the ESP packets are validated. MD5 is a one-way hashing algorithm that produces a 128-bit digest. SHA is a one-way hashing algorithm that produces a 160-bit digest. SHA is recommended because it is more secure. Both ends of the VPN tunnel must use the same Phase 2 Authentication setting.

Phase 2 SA Life Time Configure the length of time a VPN tunnel is active in Phase 2. The default is **3600** seconds.

Preshared Key This specifies the pre-shared key used to authenticate the remote IKE peer. Enter a key of keyboard and hexadecimal characters, e.g., My_@123 or 4d795f40313233. This field allows a maximum of 30 characters and/or hexadecimal values. Both ends of the VPN tunnel must use the same Preshared Key. It is strongly recommended that you change the Preshared Key periodically to maximize VPN security.

Manual

If you select Manual, you generate the key yourself, and no key negotiation is needed. Manual key management is used in small static environments or for troubleshooting purposes.



IPSec Setup

Keying Mode: Manual
Incoming SPI:
Outgoing SPI:
Encryption: DES
Authentication: MD5
Encryption Key:
Authentication Key:

Keying Mode > Manual

Incoming and Outgoing SPI (Security Parameter Index) SPI is carried in the ESP (Encapsulating Security Payload Protocol) header and enables the receiver and sender to select the SA, under which a packet should be processed. Hexadecimal values is acceptable, and the valid range is 100~ffffffff. Each tunnel must have a unique Incoming SPI and Outgoing SPI. No two tunnels share the same SPI. The Incoming SPI here must match the Outgoing SPI value at the other end of the tunnel, and vice versa.

Encryption Select a method of encryption, **DES** or **3DES**. This determines the length of the key used to encrypt or decrypt ESP packets. DES is 56-bit encryption and 3DES is 168-bit encryption. 3DES is recommended because it is more secure. Make sure both ends of the VPN tunnel use the same encryption method.

Authentication Select a method of authentication, **MD5** or **SHA1**. The Authentication method determines how the ESP packets are validated. MD5 is a one-way hashing algorithm that produces a 128-bit digest. SHA is a one-way hashing algorithm that produces a 160-bit digest. SHA1 is recommended because it is more secure. Make sure both ends of the VPN tunnel use the same authentication method.

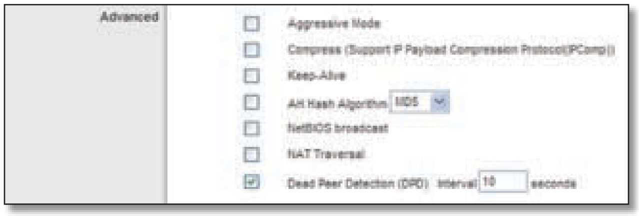
Encryption Key This field specifies a key used to encrypt and decrypt IP traffic. Enter a key of hexadecimal values. If DES is selected, the Encryption Key is 16-bit, which requires 16 hexadecimal values. If you do not enter enough hexadecimal values, then the rest of the Encryption Key will be automatically completed with zeroes, so the Encryption Key will be 16-bit. If 3DES is selected, the Encryption Key is 48-bit, which requires 40 hexadecimal values. If you do not enter enough hexadecimal values, then the rest of the Encryption Key will be automatically completed with zeroes, so the Encryption Key will be 48-bit. Make sure both ends of the VPN tunnel use the same Encryption Key.

Authentication Key This field specifies a key used to authenticate IP traffic. Enter a key of hexadecimal values.

If MD5 is selected, the Authentication Key is 32-bit, which requires 32 hexadecimal values. If you do not enter enough hexadecimal values, then the rest of the Authentication Key will be automatically completed with zeroes until it has 32 hexadecimal values. If SHA is selected, the Authentication Key is 40-bit, which requires 40 hexadecimal values. If you do not enter enough hexadecimal values, then the rest of the Authentication Key will be automatically completed with zeroes until it has 40 hexadecimal values. Make sure both ends of the VPN tunnel use the same Authentication Key.

Advanced

For most users, the settings on the VPN page should suffice; however, the Router provides advanced IPSec settings for advanced users using the IKE with Preshared Key mode. Click **Advanced** to view the Advanced settings.



Advanced

□ Aggressive Mode

□ Compress (Support IP Payload Compression Protocol(IPComp))

□ Keep-Alive

□ AH Hash Algorithm MD5

□ NetBIOS broadcast

□ NAT Traversal

☑ Dead Peer Detection (DPD) Interval 10 seconds

Advanced

Aggressive Mode There are two types of Phase 1 exchanges, Main Mode and Aggressive Mode.

Aggressive Mode requires half of the main mode messages to be exchanged in Phase 1 of the SA exchange. If network security is preferred, leave the Aggressive Mode check box unchecked (Main Mode will be used). If network speed is preferred, select **Aggressive Mode**. If you select one of the Dynamic IP types for the Remote Security Gateway Type setting, then Main Mode will be unavailable, so Aggressive Mode will be used.

Compress (Support IP Payload Compression Protocol (IP Comp)) IP Payload Compression is a protocol that reduces the size of IP datagrams. Select this option if you want the Router to propose compression when it initiates a connection. If the responders reject this proposal, then the Router will not implement compression. When the Router works as a responder, it will always accept compression, even if compression is not enabled.

Keep-Alive Keep-Alive helps maintain IPSec VPN tunnel connections. If a connection is dropped and detected, it will be re-established immediately. Select this option to use this feature.

AH Hash Algorithm The AH (Authentication Header) protocol describes the packet format and default standards for packet structure. With the use of AH as the security protocol, protection is extended forward into the IP header to verify the integrity of the entire packet by use of portions of the original IP header in the hashing process. Select this option to use this feature. Then select **MD5** or **SHA1**. MD5 produces a 128-bit digest to authenticate packet data. SHA produces a 160-bit digest to authenticate packet data. Both sides of the tunnel should use the same algorithm.

NetBIOS Broadcast Select this option to allow NetBIOS traffic to pass through the VPN tunnel. By default, the Router blocks this traffic.

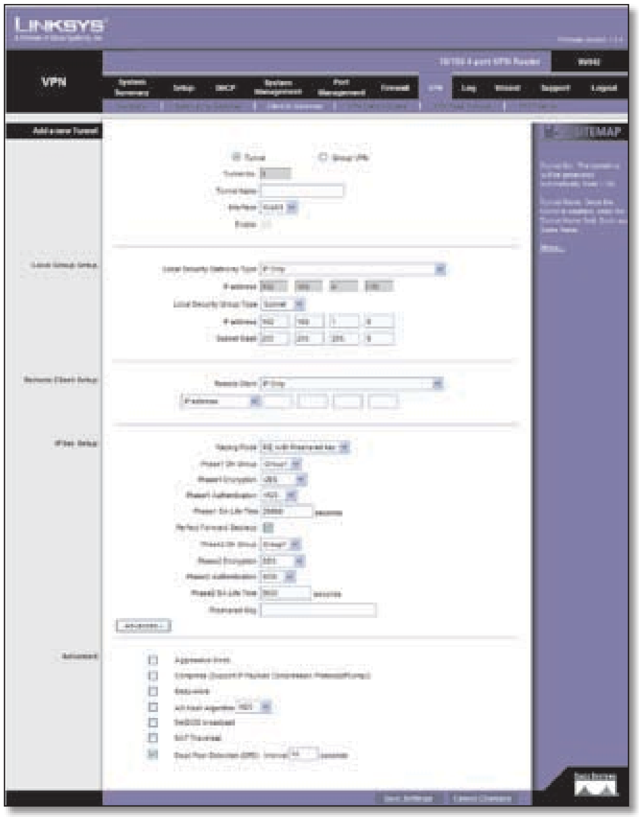
NAT Traversal Select this option to use this feature. Both the IPSec initiator and responder must support the mechanism for detecting the NAT router in the path and changing to a new port, as defined in RFC 3947.

Dead Peer Detection (DPD) When DPD is enabled, the Router will send periodic HELLO/ACK messages to check the status of the VPN tunnel (this feature can be used only when both peers or VPN devices of the VPN tunnel use the DPD mechanism). Once a dead peer has been detected, the Router will disconnect the tunnel so the connection can be re-established. Specify the interval between HELLO/ACK messages (how often you want the messages to be sent). DPD is enabled by default, and the default interval is **10** seconds.

Click **Save Settings** to save your changes, or click **Cancel Changes** to undo them.

VPN > Client to Gateway

Use this screen to create a new tunnel between a VPN device and a remote computer using third-party VPN client software, such as TheGreenBow or VPN Tracker.



VPN > Client to Gateway

NOTE: The 10/100 4-Port VPN Router supports IPSec VPN client software, including the Linksys QuickVPN software.

To manage access for Linksys QuickVPN clients, click the **VPN Client Access** tab. (For more information about QuickVPN, refer to "Appendix B: Linksys QuickVPN for Windows 2000, XP, or Vista".)

Add a New Tunnel

Tunnel/Group VPN To create a tunnel for a single VPN client, select **Tunnel**. To create a tunnel for multiple VPN clients, select **Group VPN**. The Group VPN feature facilitates setup and is not needed to individually configure remote VPN clients.

Depending on your selection, the Local Group Setup and Remote Client Setup settings will differ. Proceed to the appropriate instructions for your selection.

Tunnel

Tunnel No The tunnel number is automatically generated.

Tunnel Name Enter a name for this VPN tunnel, such as Los Angeles Office, Chicago Branch, or New York Division. This allows you to identify multiple tunnels and does not have to match the name used at the other end of the tunnel.

Interface Select the appropriate WAN port, **WAN1** or **WAN2** (available if the Dual WAN feature is enabled).

Enable Check this box to enable a VPN tunnel.

Local Group Setup

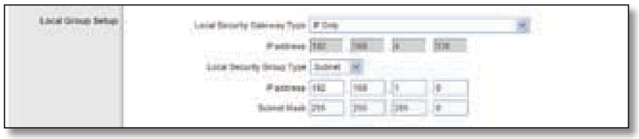
Local Security Gateway Type

Select the type you want to use: **IP Only**, **IP + Domain Name(FQDN) Authentication**, **IP + E-mail Addr.(USER FQDN) Authentication**, **Dynamic IP + Domain Name(FQDN) Authentication**, or **Dynamic IP + E-mail Addr.(USER FQDN) Authentication**. Follow the instructions for the type you want to use.

NOTE: The Local Security Gateway Type you select should match the Remote Security Gateway Type selected on the VPN device at the other end of the tunnel.

IP Only

The default is **IP Only**. Only the device with a specific IP address will be able to access the tunnel.

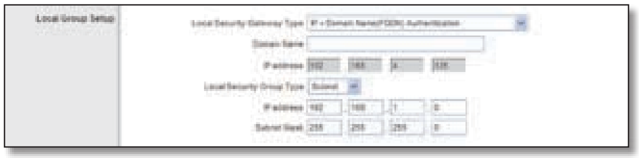


Local Security Gateway Type > IP Only

IP address The WAN (or Internet) IP address of the Router automatically appears.

IP + Domain Name(FQDN) Authentication

The IP address and FQDN must match the Remote Security Gateway of the remote VPN device, and they can only be used for one tunnel connection.

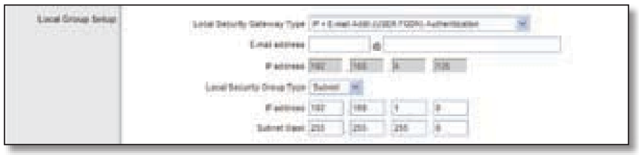


Local Security Gateway Type > IP + Domain Name(FQDN) Authentication

Domain Name Enter the Fully Qualified Domain Name (FQDN), which is the host name and domain name for a specific computer on the Internet.

IP address The WAN (or Internet) IP address of the Router automatically appears.

IP + E-mail Addr.(USER FQDN) Authentication



Local Group Setup

Local Security Gateway Type: IP + E-mail Addr.(USER FQDN) Authentication

E-mail address: @

IP address: [illegible]

Local Security Group Type: Subnet

IP address: 192 . 168 . 1 . 0

Subnet Mask: 255 . 255 . 255 . 0

Local Security Gateway Type > IP + E-mail Addr.(USER FQDN) Authentication

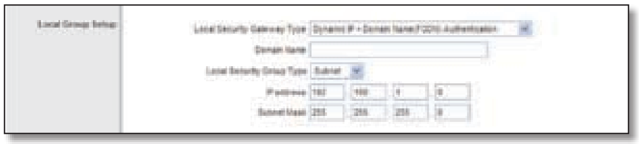
E-mail address Enter the e-mail address for authentication.

IP address The WAN (or Internet) IP address of the Router automatically appears.

Dynamic IP + Domain Name(FQDN) Authentication

The Local Security Gateway will be a dynamic IP address, so you do not need to enter the IP address. When the Remote Security Gateway requests to create a tunnel with the Router, the Router will work as a responder.

The domain name must match the Remote Security Gateway of the remote VPN device and can only be used for one tunnel connection.



Local Group Setup

Local Security Gateway Type: Dynamic IP + Domain Name(FQDN) Authentication

Domain Name:

Local Security Group Type: Subnet

IP address: 192 . 168 . 1 . 0

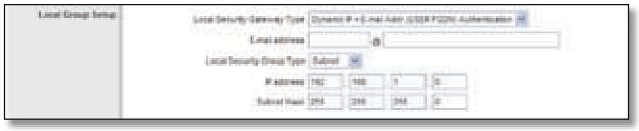
Subnet Mask: 255 . 255 . 255 . 0

Local Security Gateway Type > Dynamic IP + Domain Name(FQDN) Authentication

Domain Name Enter the domain name for authentication. (Once used, you cannot use it again to create a new tunnel connection.)

Dynamic IP + E-mail Addr.(USER FQDN) Authentication

The Local Security Gateway will be a dynamic IP address, so you do not need to enter the IP address. When the Remote Security Gateway requests to create a tunnel with the Router, the Router will work as a responder.



Local Group Setup

Local Security Gateway Type: Dynamic IP + E-mail Addr.(USER FQDN) Authentication

E-mail address: @

Local Security Group Type: Subnet

IP address: 192 . 168 . 1 . 0

Subnet Mask: 255 . 255 . 255 . 0

Local Security Gateway Type > Dynamic IP + E-mail Addr.(USER FQDN) Authentication

E-mail address Enter the e-mail address for authentication.

Local Security Group Type

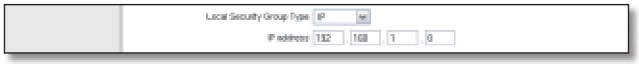
Select the local LAN user(s) behind the Router that can use this VPN tunnel. Select the type you want to use: **IP**, **Subnet**, or **IP Range**. Follow the instructions for the type you want to use.

NOTE: The Local Security Group Type you select should match the Remote Security Group Type selected on the VPN device at the other end of the tunnel.

After you have selected the Local Security Group Type, the settings available on this screen may change, depending on which selection you have made.

IP

Only the computer with a specific IP address will be able to access the tunnel.



Local Security Group Type: IP

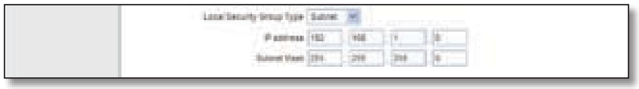
IP address: 192 . 168 . 1 . 0

Local Security Group Type > IP

IP address Enter the appropriate IP address. The default IP is **192.168.1.0**.

Subnet

The default is **Subnet**. All computers on the local subnet will be able to access the tunnel.



Local Security Group Type: Subnet

IP address: 192 . 168 . 1 . 0

Subnet Mask: 255 . 255 . 255 . 0

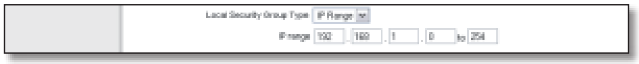
Local Security Group Type > Subnet

IP address Enter the IP address. The default is **192.168.1.0**.

Subnet Mask Enter the subnet mask. The default is **255.255.255.0**.

IP Range

Specify a range of IP addresses within a subnet that will be able to access the tunnel.



Local Security Group Type: IP Range

IP range: 192 . 168 . 1 . 0 to 254

Local Security Group Type > IP Range

IP range Enter the range of IP addresses. The default is **192.168.1.0~254**.

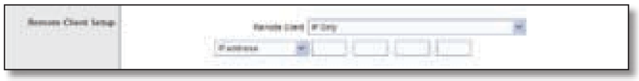
Remote Client Setup

Remote Client

Select the type you want to use: **IP Only**, **IP + Domain Name(FQDN) Authentication**, **IP + E-mail Addr.(USER FQDN) Authentication**, **Dynamic IP + Domain Name(FQDN) Authentication**, or **Dynamic IP + E-mail Addr.(USER FQDN) Authentication**. Follow the instructions for the type you want to use.

IP Only

The default is **IP Only**. Only the computer with a specific IP address will be able to access the tunnel. Select **IP address** or **IP by DNS Resolved**.



Remote Client Setup

Remote Client: IP Only

IP address

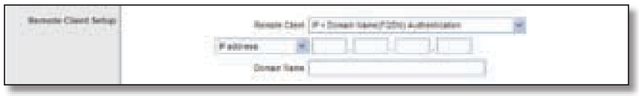
Remote Client > IP Only

IP address Select this option if you know the static IP address of the remote computer at the other end of the tunnel, and then enter the IP address.

IP by DNS Resolved Select this option if you do not know the static IP address of the remote computer but you do know its domain name. Then enter the remote computer's domain name on the Internet. The Router will retrieve the IP address of the remote VPN device via its public DNS records.

IP + Domain Name(FQDN) Authentication

The IP address and domain name ID must match the Local Gateway of the remote computer, and they can only be used for one tunnel connection.



Remote Client Setup

Remote Client: IP + Domain Name(FQDN) Authentication

IP address

Domain Name

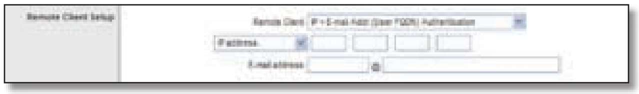
Remote Client > IP + Domain Name(FQDN) Authentication

IP address Select this option if you know the static IP address of the remote computer at the other end of the tunnel, and then enter the IP address.

IP by DNS Resolved Select this option if you do not know the static IP address of the remote computer but you do know its domain name. Then enter the remote computer's domain name on the Internet. The Router will retrieve the IP address of the remote VPN device via its public DNS records.

Domain Name Enter the domain name as an ID (it cannot be a real domain name on the Internet).

IP + E-mail Addr.(USER FQDN) Authentication



Remote Client Setup

Remote Client: IP + E-mail Addr.(User FQDN) Authentication

IP address

E-mail address: @

Remote Client > IP + E-mail Addr.(USER FQDN) Authentication

IP address Select this option if you know the static IP address of the remote computer at the other end of the tunnel, and then enter the IP address.

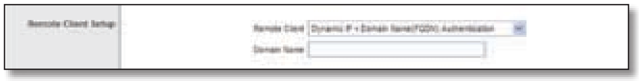
IP by DNS Resolved Select this option if you do not know the static IP address of the remote computer but you do know its domain name. Then enter the remote computer's domain name on the Internet. The Router will retrieve the IP address of the remote VPN device via its public DNS records.

E-mail address Enter the e-mail address as an ID.

Dynamic IP + Domain Name(FQDN) Authentication

The Local Security Gateway will be a dynamic IP address, so you do not need to enter the IP address. When the Remote Security Gateway requests to create a tunnel with the Router, the Router will work as a responder.

The domain name must match the local setting of the remote computer and can only be used for one tunnel connection.



Remote Client Setup

Remote Client: Dynamic IP + Domain Name(FQDN) Authentication

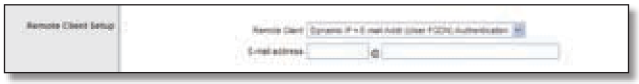
Domain Name

Remote Client > Dynamic IP + Domain Name(FQDN) Authentication

Domain Name Enter the domain name for authentication. (Once used, you cannot use it again to create a new tunnel connection.)

Dynamic IP + E-mail Addr.(USER FQDN) Authentication

The Remote Security Gateway will be a dynamic IP address, so you do not need to enter the IP address. When the remote computer requests to create a tunnel with the Router, the Router will work as a responder.



Remote Client Setup

Remote Client: Dynamic IP + E-mail Addr.(User FQDN) Authentication

E-mail address: @

Remote Client > Dynamic IP + E-mail Addr.(USER FQDN) Authentication

E-mail address Enter the e-mail address for authentication.

Group VPN

Group No The group number is automatically generated. (The Router supports up to two group VPNs.)

Group Name Enter a name for this group VPN, such as American Sales Group or West Coast Marketing. This allows you to identify multiple group VPNs and does not have to match the name used at the other end of the tunnel.

Interface Select the appropriate WAN port, **WAN1** or **WAN2** (available if the Dual WAN feature is enabled).

Enable Check this box to enable a group VPN.

Local Group Setup

Local Security Group Type

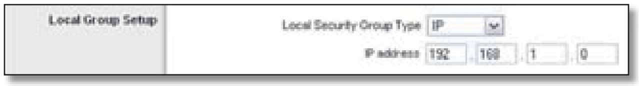
Select the local LAN user(s) behind the Router that can use this VPN tunnel. Select the type you want to use: **IP**, **Subnet**, or **IP Range**. Follow the instructions for the type you want to use.

NOTE: The Local Security Group Type you select should match the Remote Security Group Type selected on the remote computer at the other end of the tunnel.

After you have selected the Local Security Group Type, the settings available on this screen may change, depending on which selection you have made.

IP

Only the computer with a specific IP address will be able to access the tunnel.



Local Group Setup

Local Security Group Type: IP

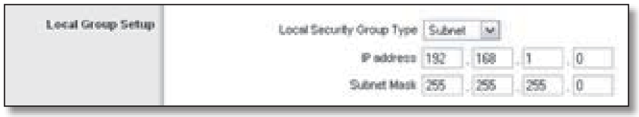
IP address: 192 . 168 . 1 . 0

Local Security Group Type > IP

IP address Enter the appropriate IP address. The default IP is **192.168.1.0**.

Subnet

The default is **Subnet**. All computers on the local subnet will be able to access the tunnel.



Local Group Setup

Local Security Group Type: Subnet

IP address: 192 . 168 . 1 . 0

Subnet Mask: 255 . 255 . 255 . 0

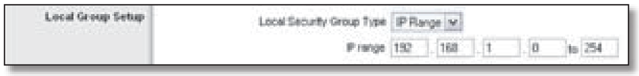
Local Security Group Type > Subnet

IP address Enter the IP address. The default is **192.168.1.0**.

Subnet Mask Enter the subnet mask. The default is **255.255.255.0**.

IP Range

Specify a range of IP addresses within a subnet that will be able to access the tunnel.



Local Group Setup

Local Security Group Type: IP Range

IP range: 192 . 168 . 1 . 0 to 254

Local Security Group Type > IP Range

IP range Enter the range of IP addresses. The default is **192.168.1.0~254**.

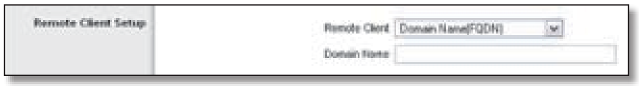
Remote Client Setup

Remote Client

Select the type you want to use: **Domain Name(FQDN)**, **E-mail Addr.(USER FQDN)**, or **Microsoft XP/2000 VPN Client**. Follow the instructions for the type you want to use.

Domain Name(FQDN)

The default is **Domain Name(FQDN)**.



Remote Client Setup

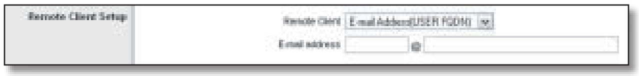
Remote Client: Domain Name(FQDN)

Domain Name:

Remote Client > Domain Name(FQDN)

Domain Name Enter the Fully Qualified Domain Name (FQDN), which is the host name and domain name for a specific computer on the Internet. When the remote computer requests to create a tunnel with the Router, the Router will work as a responder.

E-mail Address(UserFQDN)



Remote Client Setup

Remote Client: E-mail Address(USER FQDN)

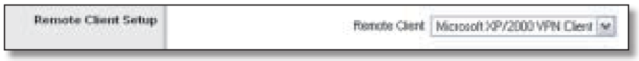
E-mail address: @

Remote Client > E-mail Address(UserFQDN)

E-mail address Enter the e-mail address of the user FQDN.

Microsoft XP/2000 VPN Client

Dynamic IP users, such as PPPoE or DHCP users, who use the Microsoft VPN client software, can use this option. (The Microsoft VPN client software does not support Aggressive mode and FQDN or User FQDN ID options.)



Remote Client Setup

Remote Client: Microsoft XP/2000 VPN Client

Remote Client > Microsoft XP/2000 VPN Client

IPSec Setup

In order for any encryption to occur, the two ends of a VPN tunnel must agree on the methods of encryption, decryption, and authentication. This is done by sharing a key to the encryption code. For key management, the default mode is **IKE with Preshared Key**.

Keying Mode Select **IKE with Preshared Key** or **Manual**. Both ends of a VPN tunnel must use the same mode of key management. After you have selected the mode, the settings available on this screen may change, depending on the selection you have made. Follow the instructions for the mode you want to use. (Manual mode is available for VPN tunnels only, not group VPNs.)

IKE with Preshared Key

IKE is an Internet Key Exchange protocol used to negotiate key material for Security Association (SA). IKE uses the Preshared Key to authenticate the remote IKE peer.

Phase 1 DH Group Phase 1 is used to create the SA. DH (Diffie-Hellman) is a key exchange protocol used during Phase 1 of the authentication process to establish preshared keys. There are three groups of different prime key lengths. Group 1 is 768 bits, and Group 2 is 1,024 bits. Group 5 is 1,536 bits. If network speed is preferred, select **Group 1**. If network security is preferred, select **Group 5**.

Phase 1 Encryption Select a method of encryption: **DES** (56-bit), **3DES** (168-bit), **AES-128** (128-bit), **AES-192** (192-bit), or **AES-256** (256-bit). The method determines the length of the key used to encrypt or decrypt ESP packets. AES-256 is recommended because it is the most secure. Make sure both ends of the VPN tunnel use the same encryption method.

Phase 1 Authentication Select a method of authentication, **MD5** or **SHA**. The authentication method determines how the ESP packets are validated. MD5 is a one-way hashing algorithm that produces a 128-bit digest. SHA is a one-way hashing algorithm that produces a 160-bit digest. SHA is recommended because it is more secure. Make sure both ends of the VPN tunnel use the same authentication method.

Phase 1 SA Life Time Configure the length of time a VPN tunnel is active in Phase 1. The default value is **28800** seconds.

Perfect Forward Secrecy If the Perfect Forward Secrecy (PFS) feature is enabled, IKE Phase 2 negotiation will generate new key material for IP traffic encryption and authentication, so hackers using brute force to break encryption keys will not be able to obtain future IPSec keys.

Phase 2 DH Group If the Perfect Forward Secrecy feature is disabled, then no new keys will be generated, so you do not need to set the Phase 2 DH Group (the key for Phase 2 will match the key in Phase 1).

There are three groups of different prime key lengths. Group 1 is 768 bits, and Group 2 is 1,024 bits. Group 5 is 1,536 bits. If network speed is preferred, select **Group 1**. If network security is preferred, select **Group 5**. You do not have to use the same DH Group that you used for Phase 1.

Phase 2 Encryption Phase 2 is used to create one or more IPSec SAs, which are then used to key IPSec sessions. Select a method of encryption: **NULL**, **DES** (56-bit), **3DES** (168-bit), **AES-128** (128-bit), **AES-192** (192-bit), or **AES-256** (256-bit). It determines the length of the key used to encrypt or decrypt ESP packets. AES-256 is recommended because it is the most secure. Both ends of the VPN tunnel must use the same Phase 2 Encryption setting.

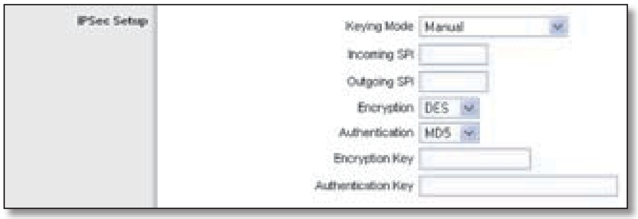
Phase 2 Authentication Select a method of authentication, **NULL**, **MD5**, or **SHA**. The authentication method determines how the ESP packets are validated. MD5 is a one-way hashing algorithm that produces a 128-bit digest. SHA is a one-way hashing algorithm that produces a 160-bit digest. SHA is recommended because it is more secure. Both ends of the VPN tunnel must use the same Phase 2 Authentication setting.

Phase 2 SA Life Time Configure the length of time a VPN tunnel is active in Phase 2. The default is **3600** seconds.

Preshared Key This specifies the pre-shared key used to authenticate the remote IKE peer. Enter a key of keyboard and hexadecimal characters, e.g., My_@123 or 4d795f40313233. This field allows a maximum of 30 characters and/or hexadecimal values. Both ends of the VPN tunnel must use the same Preshared Key. It is strongly recommended that you change the Preshared Key periodically to maximize VPN security.

Manual

If you select Manual, you generate the key yourself, and no key negotiation is needed. Manual key management is used in small static environments or for troubleshooting purposes.



IPSec Setup

Keying Mode: Manual
Incoming SPI:
Outgoing SPI:
Encryption: DES
Authentication: MD5
Encryption Key:
Authentication Key:

Keying Mode > Manual (Tunnel Only)

Incoming and Outgoing SPI (Security Parameter Index) SPI is carried in the ESP (Encapsulating Security Payload Protocol) header and enables the receiver and sender to select the SA, under which a packet should be processed. Hexadecimal values is acceptable, and the valid range is 100~ffffffff. Each tunnel must have a unique Incoming SPI and Outgoing SPI. No two tunnels share the same SPI. The Incoming SPI here must match the Outgoing SPI value at the other end of the tunnel, and vice versa.

Encryption Select a method of encryption, **DES** or **3DES**. This determines the length of the key used to encrypt or decrypt ESP packets. DES is 56-bit encryption and 3DES is 168-bit encryption. 3DES is recommended because it is more secure. Make sure both ends of the VPN tunnel use the same encryption method.

Authentication Select a method of authentication, **MD5** or **SHA1**. The Authentication method determines how the ESP packets are validated. MD5 is a one-way hashing algorithm that produces a 128-bit digest. SHA is a one-way hashing algorithm that produces a 160-bit digest. SHA1 is recommended because it is more secure. Make sure both ends of the VPN tunnel use the same authentication method.

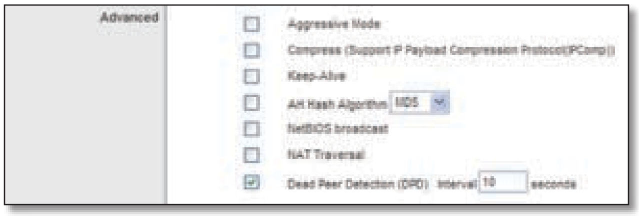
Encryption Key This field specifies a key used to encrypt and decrypt IP traffic. Enter a key of hexadecimal values.

If DES is selected, the Encryption Key is 16-bit, which requires 16 hexadecimal values. If you do not enter enough hexadecimal values, then the rest of the Encryption Key will be automatically completed with zeroes, so the Encryption Key will be 16-bit. If 3DES is selected, the Encryption Key is 48-bit, which requires 40 hexadecimal values. If you do not enter enough hexadecimal values, then the rest of the Encryption Key will be automatically completed with zeroes, so the Encryption Key will be 48-bit. Make sure both ends of the VPN tunnel use the same Encryption Key.

Authentication Key This field specifies a key used to authenticate IP traffic. Enter a key of hexadecimal values. If MD5 is selected, the Authentication Key is 32-bit, which requires 32 hexadecimal values. If you do not enter enough hexadecimal values, then the rest of the Authentication Key will be automatically completed with zeroes until it has 32 hexadecimal values. If SHA is selected, the Authentication Key is 40-bit, which requires 40 hexadecimal values. If you do not enter enough hexadecimal values, then the rest of the Authentication Key will be automatically completed with zeroes until it has 40 hexadecimal values. Make sure both ends of the VPN tunnel use the same Authentication Key.

Advanced

For most users, the settings on the VPN page should suffice; however, the Router provides advanced IPSec settings for advanced users using the IKE with Preshared Key mode. Click **Advanced** to view the Advanced settings.


Advanced

□ Aggressive Mode
□ Compress (Support IP Payload Compression Protocol(IPComp))
□ Keep-Alive
□ AH Hash Algorithm MD5
□ NetBIOS broadcast
□ NAT Traversal
☑ Dead Peer Detection (DPD) Interval 10 seconds

Advanced

Aggressive Mode There are two types of Phase 1 exchanges, Main Mode and Aggressive Mode.

Aggressive Mode requires half of the main mode messages to be exchanged in Phase 1 of the SA exchange. If network security is preferred, leave the Aggressive Mode check box unchecked (Main Mode will be used). If network speed is preferred, select **Aggressive Mode**. If you select one of the Dynamic IP types for the Remote Security Gateway Type setting, then Main Mode will be unavailable, so Aggressive Mode will be used.

Compress (Support IP Payload Compression Protocol (IP Comp)) IP Payload Compression is a protocol that reduces the size of IP datagrams. Select this option if you want the Router to propose compression when it initiates a connection. If the responders reject this proposal, then the Router will not implement compression. When the Router works as a responder, it will always accept compression, even if compression is not enabled.

Keep-Alive Keep-Alive helps maintain IPSec VPN tunnel connections. If a connection is dropped and detected, it will be re-established immediately. Select this option to use this feature.

AH Hash Algorithm The AH (Authentication Header) protocol describes the packet format and default standards for packet structure. With the use of AH as the security protocol, protection is extended forward into the IP header to verify the integrity of the entire packet by use of portions of the original IP header in the hashing process. Select this option to use this feature. Then select **MD5** or **SHA1**. MD5 produces a 128-bit digest to authenticate packet data. SHA produces a 160-bit digest to authenticate packet data. Both sides of the tunnel should use the same algorithm.

NetBIOS Broadcast Select this option to allow NetBIOS traffic to pass through the VPN tunnel. By default, the Router blocks this traffic.

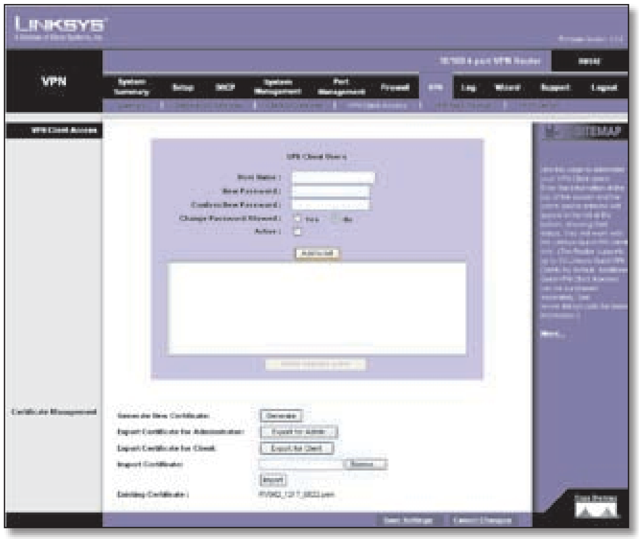
NAT Traversal Select this option to use this feature. Both the IPSec initiator and responder must support the mechanism for detecting the NAT router in the path and changing to a new port, as defined in RFC 3947.

Dead Peer Detection (DPD) (This option is available for VPN tunnels only, not group VPNs.) When DPD is enabled, the Router will send periodic HELLO/ACK messages to check the status of the VPN tunnel (this feature can be used only when both peers or VPN devices of the VPN tunnel use the DPD mechanism). Once a dead peer has been detected, the Router will disconnect the tunnel so the connection can be re-established. Specify the interval between HELLO/ACK messages (how often you want the messages to be sent). DPD is enabled by default, and the default interval is **10** seconds.

Click **Save Settings** to save your changes, or click **Cancel Changes** to undo them.

VPN > VPN Client Access

The *VPN Client Access* screen allows you to manage access for Linksys QuickVPN clients. (The Router supports up to 50 Linksys QuickVPN clients free of charge. If the Router you have only supports up to ten clients, then upgrade its firmware. Refer to “Appendix F: Firmware Upgrade” for instructions.)



VPN > VPN Client Access

VPN Client Access

For each QuickVPN client, do the following:

1. Export a client certificate.
2. Configure a user name and password.
3. Add the QuickVPN client to the list.

VPN Client Users

User Name Enter the user name.

New Password Enter the new password.

Confirm New Password Re-enter the new password.

Change Password Allowed To allow the user to change his or her password, select **Yes**. Otherwise, keep the default, **No**.

Active To activate the new user, select **Active**.

To add the new user to the list, click **Add to list**.

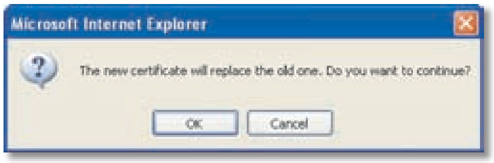
After a user has been added, you can change the user's settings. Select the user from the list, and make your changes. Then click **Update this user**.

To delete a user, select the user from the list, and then click **Delete selected users**.

Certificate Management

Manage the certificate for securing communication between the Router and QuickVPN clients.

Generate New Certificate To generate a new certificate to replace the existing certificate on the Router, click **Generate**. After clicking the button, a confirmation screen appears. Click **OK** to continue.



The new certificate will replace the old one. Do you want to continue?

Generate Certificate Confirmation

Export Certificate for Administrator The certificate for the administrator contains the private key and should be stored in a safe place as a backup. If you reset the Router to its factory defaults, then you can import the certificate and restore it on the Router.

To save the certificate as a file, click **Export for Admin**. By default, the certificate file is named **RV042_<MMDD>_<HHMM>.pem**, which you can rename. (MMDD stands for month and day; HHMM stands for hours and minutes.) Follow the on-screen instructions to select the location where you want to store your certificate.

Export Certificate for Client The certificate for the client must be placed in the install directory of the QuickVPN client software.

To save the certificate as a file, click **Export for Client**. Then follow the on-screen instructions. By default, the certificate file is named **RV042_<MMDD>_<HHMM>_Client.pem**, which you can rename. (MMDD stands for month and day; HHMM stands for hours and minutes.) Follow the on-screen instructions to save the file in the install directory of the QuickVPN client software.

Import Certificate To specify the location of the administrator certificate, click **Browse** and follow the on-screen instructions. (This is the file you previously saved using the Export Certificate for Administrator option.) After you have selected the file, click **Import**.

Existing Certificate The filename of the current certificate is displayed.

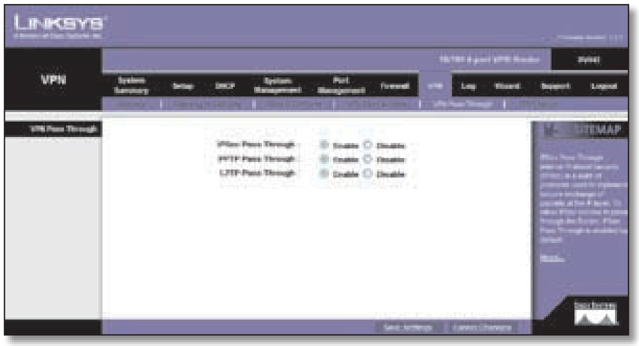
Click **Save Settings** to save your changes, or click **Cancel Changes** to undo them.

When you first save these settings, a message will appear, asking if you would like the Router to automatically change the LAN IP address to prevent conflicting IP addresses. To change the LAN IP address, click **Yes**. If an IP conflict occurs, the QuickVPN client will not connect to the Router.

VPN > VPN Pass Through

The *VPN Pass Through* screen allows you to enable or disable passthrough for a variety of VPN methods.

✓ **NOTE:** VPN passthrough is enabled so that VPN clients in the LAN of the Router can reach the VPN server on the Internet.



IPSec Pass Through: ● Enable ○ Disable
PPTP Pass Through: ● Enable ○ Disable
L2TP Pass Through: ● Enable ○ Disable

VPN > VPN Pass Through

VPN Pass Through

IPSec Pass Through Internet Protocol Security (IPSec) is a suite of protocols used to implement secure exchange of packets at the IP layer. IPSec Pass Through is enabled by default to allow IPSec tunnels to pass through the Router.

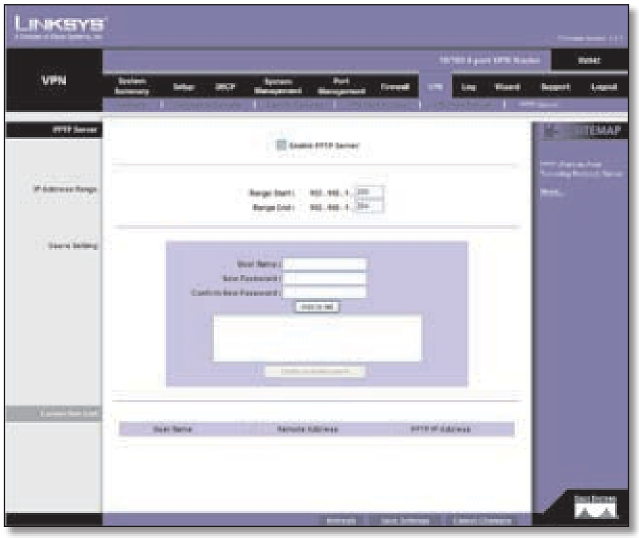
PPTP Pass Through Point-to-Point Tunneling Protocol (PPTP) allows the Point-to-Point Protocol (PPP) to be tunneled through an IP network. PPTP Pass Through is enabled by default.

L2TP Pass Through Layer 2 Tunneling Protocol is the method used to enable Point-to-Point sessions via the Internet on the Layer 2 level. L2TP Pass Through is enabled by default.

Click **Save Settings** to save your changes, or click **Cancel Changes** to undo them.

VPN > PPTP Server

The *PPTP Server* screen allows you to enable up to five PPTP VPN tunnels between the Router and PPTP VPN clients. These PPTP VPN clients must be computers running PPTP client software and Windows XP or 2000.



VPN > PPTP Server

PPTP Server

Enable PPTP Server Select this option to allow PPTP VPN tunnels.

IP Address Range

Range Start Enter the starting LAN IP address of the range allotted to PPTP VPN clients. The default is **192.168.1.200**.

Range End Enter the ending LAN IP address of the range allotted to PPTP VPN clients. The default is **192.168.1.204**.

NOTE: The LAN IP address range for PPTP VPN clients should be outside of the normal DHCP range of the Router.

Users Setting

The Router uses this information to identify authorized PPTP VPN clients.

User Name Enter a name for the PPTP VPN client.

New Password Enter a password for the PPTP VPN client.

Confirm New Password Re-enter the password.

Click **Add to List**, and configure as many entries as you would like, up to a maximum of five. To delete an entry, select it and click **Delete selected users**.

Connection List

The PPTP VPN tunnels are displayed.

User Name It shows the name of the PPTP VPN client.

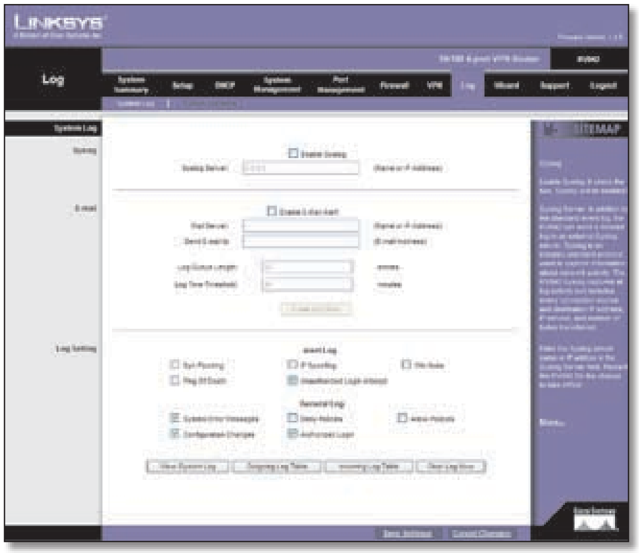
Remote Address This shows the WAN IP address of the PPTP VPN client.

PPTP IP Address This shows the PPTP IP address of the PPTP VPN client. When the PPTP VPN client connects to the PPTP server, it is assigned a PPTP IP address by the PPTP server, which has a pool of pre-configured IP addresses available. (With its PPTP IP address, the PPTP VPN client acts like it belongs to the LAN of the PPTP server.)

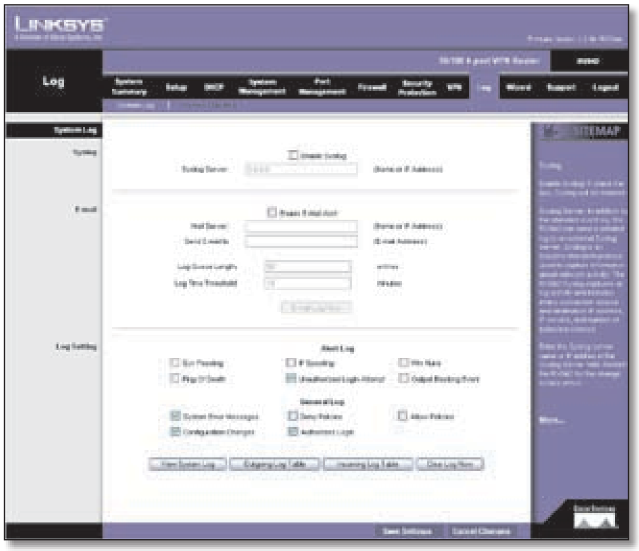
Click **Refresh** to update the on-screen information. Click **Save Settings** to save your changes, or click **Cancel Changes** to undo them.

Log > System Log

Configure the Router's log settings, so you can specify how you want its activity logs handled.



Log > System Log



Log > System Log (ProtectLink Enabled)

System Log

Syslog

Syslog is a standard protocol used to capture information about network activity. The Router supports this protocol and can send its activity logs to an external server.

Enable Syslog Select this option to enable the Router's Syslog feature.

Syslog Server In addition to the standard event log, the Router can send a detailed log to an external Syslog server. The Router's Syslog captures all log activities and includes this information about all data transmissions: every connection source and destination IP address, IP service, and number of bytes transferred. Enter the Syslog server name or IP address. Click **Save Settings** to save your changes, and then restart the Router for the changes to take effect.

E-mail

You may want logs or alert messages to be e-mailed to you. If so, then configure the E-mail settings.

Enable E-Mail Alert Select this option to enable the Router's E-Mail Alert feature.

Mail Server If you want any log or alert information e-mailed to you, then enter the name or numerical IP address of your SMTP server. Your ISP can provide you with this information.

Send E-mail to Enter the e-mail address that will receive your log files. If you do not want copies of the log information e-mailed to you, then leave this field blank.

Log Queue Length You can designate the length of the log that will be e-mailed to you. The default is **50** entries, so unless you change this setting, the Router will e-mail the log to you when there are more than 50 log entries.

Log Time Threshold You can designate how often the log will be e-mailed to you. The default is **10** minutes, so unless you change this setting, the Router will e-mail the log to you every 10 minutes.

The Router will e-mail the log every time the Log Queue Length or Log Time Threshold is reached.

Click **E-mail Log Now** to immediately send the log to the address in the *Send E-mail to* field.

Log Setting

Alert Log

Syn Flooding Select this option if you want Syn Flooding events to trigger an alert.

IP Spoofing Select this option if you want IP Spoofing events to trigger an alert.

Win Nuke Select this option if you want Win Nuke events to trigger an alert.

Ping of Death Select this option if you want Ping of Death events to trigger an alert.

Unauthorized Login Attempt If this option is enabled, Unauthorized Login Attempt events trigger an alert. This option is enabled by default.

Output Blocking Event (This option is available only if the Trend Micro ProtectLink service is enabled.) Select this option if you want website blocking events to trigger an alert.

General Log

System Error Messages If this option is enabled, system error messages are included. This option is enabled by default.

Deny Policies Select this option if you do not want to include log events from Deny rules on the *Firewall > Access Rule* screen. Log events from Deny rules will be logged separately from Deny Policies if the option, log packets match this rule, is selected.

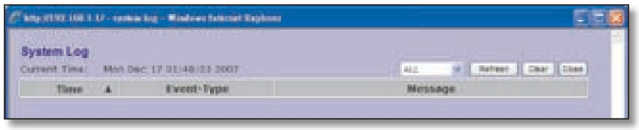
Allow Policies Select this option if you want to include log events from Allow rules on the *Firewall > Access Rule* screen. Log events from Allow rules will be logged whether or not the option, log packets match this rule, is selected.

Configuration Changes If this option is enabled, configuration changes are included. This option is enabled by default.

Authorized Login If this option is enabled, authorized login events are included. This option is enabled by default.

View System Log

To view logs, click this option. The *System Log* screen appears.



Current Time: Mon Dec 17 01:48:33 2007

System Log

Current Time The time of the Router is displayed.

Select the log you wish to view: **ALL**, **System Log**, **Access Log**, **Firewall Log**, or **VPN Log**. The All log displays a log of all activities. The System Log displays a list of cold and warm starts, web login successes and failures, and packet filtering policies. The Access Log displays all logins. The Firewall Log displays all activities regarding the Router's firewall. The VPN Log shows information about VPN tunnel activity.

Time The time of each log event is displayed. You can sort each log by time sequence.

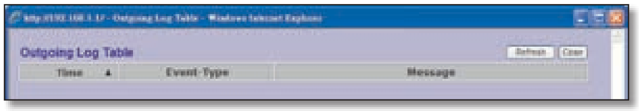
Event-Type The type of log event is displayed.

Message The message associated with each log event is displayed.

To update a log, click **Refresh**. To clear a log, click **Clear**. To exit the *System Log* screen and return to the *Log > System Log* screen, click **Close**.

Outgoing Log Table

To view the outgoing log information, click this option.



Outgoing Log Table

Time The time of each log event is displayed. You can sort each log by time sequence.

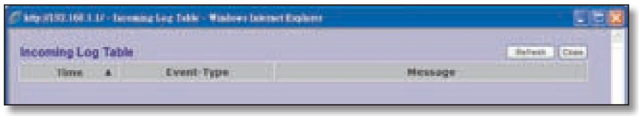
Event-Type The type of log event is displayed.

Message The message associated with each log event is displayed.

To update the on-screen, click **Refresh**. To exit the *Outgoing Log Table* screen and return to the *Log > System Log* screen, click **Close**.

Incoming Log Table

To view the incoming log information, click this option.



Incoming Log Table

Time The time of each log event is displayed. You can sort each log by time sequence.

Event-Type The type of log event is displayed.

Message The message associated with each log event is displayed.

To update the on-screen, click **Refresh**. To exit the *Incoming Log Table* screen and return to the *Log > System Log* screen, click **Close**.

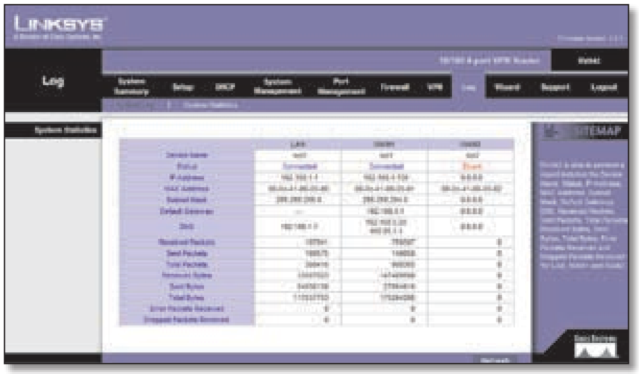
Clear Log Now

To clear your log without e-mailing it, click this option. Only use this option if you are willing to lose your log information.

Click **Save Settings** to save your changes, or click **Cancel Changes** to undo them.

Log > System Statistics

This screen displays statistics about all of the Router's ports (LAN and WAN ports). For each port, the following statistics are listed: Device Name, Status, IP Address, MAC Address, Subnet Mask, Default Gateway, DNS, number of Received Packets, number of Sent Packets, number of Total Packets, number of Received Bytes, number of Sent Bytes, number of Total Bytes, number of Error Packets Received, and number of Dropped Packets Received.

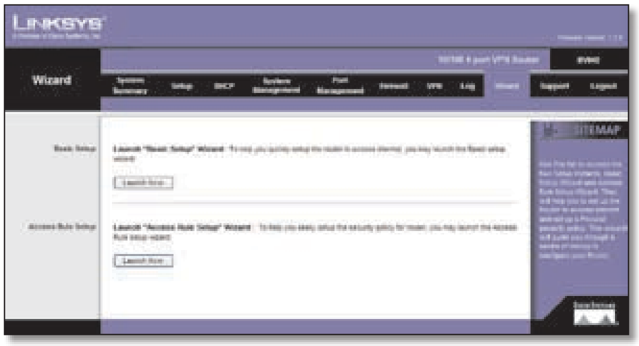


Log > System Statistics

Click **Refresh** to update the statistics.

Wizard

Use this tab to access two Setup Wizards, the Basic Setup Wizard and the Access Rule Setup Wizard. Run the Basic Setup Wizard to set up the Router for your Internet connection(s). Run the Access Rule Setup Wizard to set up the security policy for the Router.



Basic Setup

Launch "Basic Setup" Wizard: To help you quickly setup the router to access internet, you may launch the Basic setup wizard.

Launch Now

Access Rule Setup

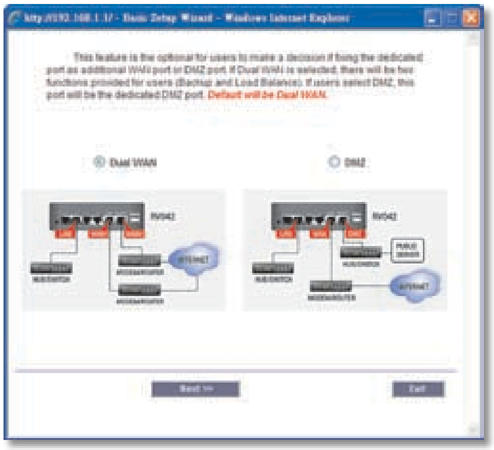
Launch "Access Rule Setup" Wizard: To help you easily setup the security policy for router, you may launch the Access Rule setup wizard.

Launch Now

Wizard

Basic Setup

1. Click **Launch Now** to run the Basic Setup Wizard.
2. To use the WAN2 (DMZ/Internet) port as a WAN (Internet) port, select **Dual WAN**. To use the WAN2 (DMZ/Internet) port as a DMZ port, select **DMZ**. Then click **Next** to continue. Click **Exit** if you want to exit the Setup Wizard.


http://192.168.1.1/ - Basic Setup Wizard - Windows Internet Explorer
RV042
LAN
WAN
DMZ
HUB/SWITCH
MODEM/ROUTER
INTERNET
PUBLIC SERVER

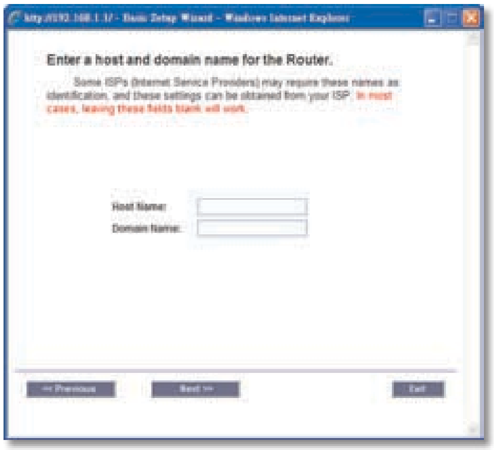
This feature is the optional for users to make a decision if fixing the dedicated port as additional WAN port or DMZ port. If Dual WAN is selected, there will be two functions provided for users (Backup and Load Balance). If users select DMZ, this port will be the dedicated DMZ port. Default will be Dual WAN.

● Dual WAN ○ DMZ

Next >> Exit

Dual WAN or DMZ

3. Your Internet Service Provider (ISP) may require you to use a host and domain name for your Internet connection. If your ISP requires them, complete the *Host Name* and *Domain Name* fields; otherwise leave these blank. Click **Next** to continue. Click **Previous** if you want to return to the previous screen. Click **Exit** if you want to exit the Setup Wizard.


http://192.168.1.1/ - Basic Setup Wizard - Windows Internet Explorer

Enter a host and domain name for the Router.

Some ISPs (Internet Service Providers) may require these names as identification, and these settings can be obtained from your ISP. In most cases, leaving these fields blank will work.

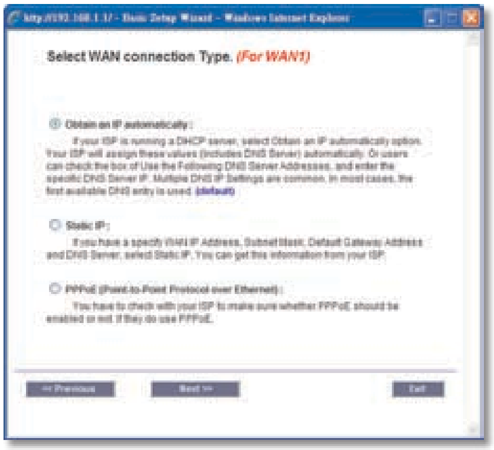
Host Name:

Domain Name:

<< Previous Next >> Exit

Host and Domain Name

4. Select the WAN (or Internet) Connection Type for the WAN port. Select the appropriate connection type: **Obtain an IP automatically**, **Static IP**, or **PPPoE**. Click **Next** to continue. Click **Previous** if you want to return to the previous screen. Click **Exit** if you want to exit the Setup Wizard.



http://192.168.1.1/ - Basic Setup Wizard - Windows Internet Explorer

Select WAN connection Type. (For WAN1)

● Obtain an IP automatically :
If your ISP is running a DHCP server, select Obtain an IP automatically option. Your ISP will assign these values (includes DNS Server) automatically. Or users can check the box of Use the Following DNS Server Addresses, and enter the specific DNS Server IP. Multiple DNS IP Settings are common. In most cases, the first available DNS entry is used. (default)

○ Static IP :
If you have a specify WAN IP Address, Subnet Mask, Default Gateway Address and DNS Server, select Static IP. You can get this information from your ISP.

○ PPPoE (Point-to-Point Protocol over Ethernet) :
You have to check with your ISP to make sure whether PPPoE should be enabled or not if they do use PPPoE.

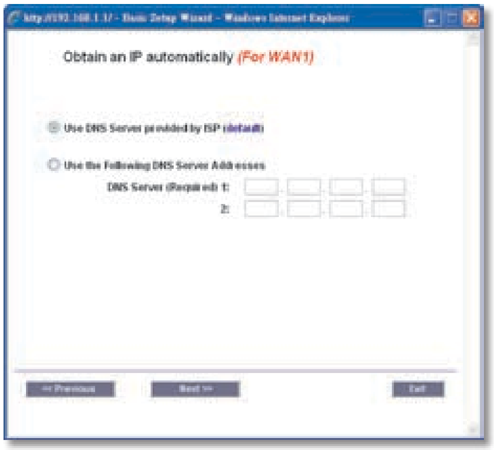
WAN Connection Type

5. Depending on which connection type you have selected, the appropriate screen will appear. Follow the instructions for the appropriate connection type:

Obtain an IP automatically

If you want to use the ISP's DNS server, select **Use DNS Server provided by ISP (default)**. If you want to designate a specific DNS server IP address, select **Use the Following DNS Server Addresses**, and enter the DNS server IP addresses you want to use (you must enter at least one).

Click **Next** to continue, and proceed to step 6. Click **Previous** if you want to return to the previous screen. Click **Exit** if you want to exit the Setup Wizard.



http://192.168.1.1/ - Basic Setup Wizard - Windows Internet Explorer

Obtain an IP automatically (For WAN1)

● Use DNS Server provided by ISP (default)

○ Use the Following DNS Server Addresses

DNS Server (Required) 1: □ . □ . □ . □

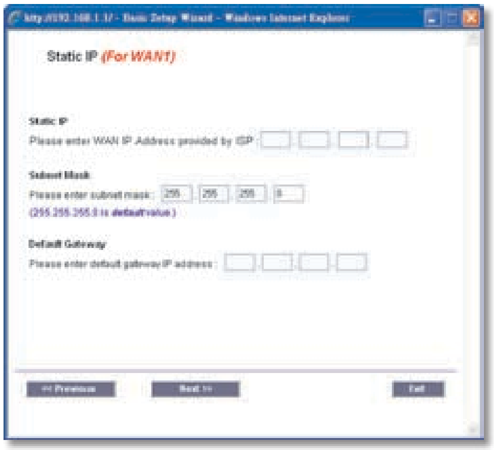
2: □ . □ . □ . □

Obtain an IP Automatically

Static IP

Complete the *Static IP*, *Subnet Mask*, and *Default Gateway* fields with the settings provided by your ISP.

Click **Next** to continue. Click **Previous** if you want to return to the previous screen. Click **Exit** if you want to exit the Setup Wizard.



http://192.168.1.1/ - Basic Setup Wizard - Windows Internet Explorer

Static IP (For WAN1)

Static IP
Please enter WAN IP Address provided by ISP : □ . □ . □ . □

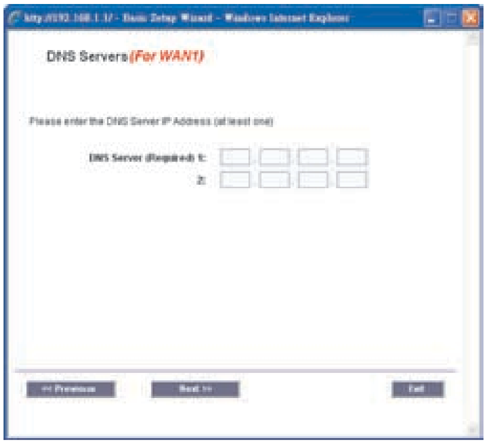
Subnet Mask
Please enter subnet mask : 255 . 255 . 255 . 0
(255.255.255.0 is default value)

Default Gateway
Please enter default gateway IP address : □ . □ . □ . □

Static IP

On the *DNS Servers* screen, enter the DNS server IP addresses you want to use (you must enter at least one).

Click **Next** to continue, and proceed to step 6. Click **Previous** if you want to return to the previous screen. Click **Exit** if you want to exit the Setup Wizard.



http://192.168.1.1/ - Basic Setup Wizard - Windows Internet Explorer

DNS Servers (For WAN1)

Please enter the DNS Server IP Address (at least one)

DNS Server (Required) 1: □ . □ . □ . □

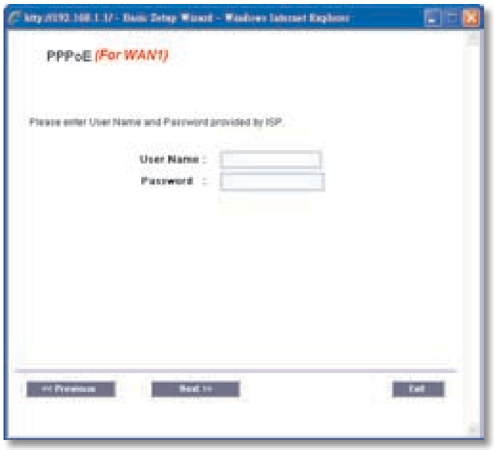
2: □ . □ . □ . □

DNS Servers

PPPoE

Complete the *User Name* and *Password* fields with the information provided by your ISP.

Click **Next** to continue. Click **Previous** if you want to return to the previous screen. Click **Exit** if you want to exit the Setup Wizard.


http://192.168.1.1/ - Basic Setup Wizard - Windows Internet Explorer

PPPoE *(For WAN1)*

Please enter User Name and Password provided by ISP.

User Name :

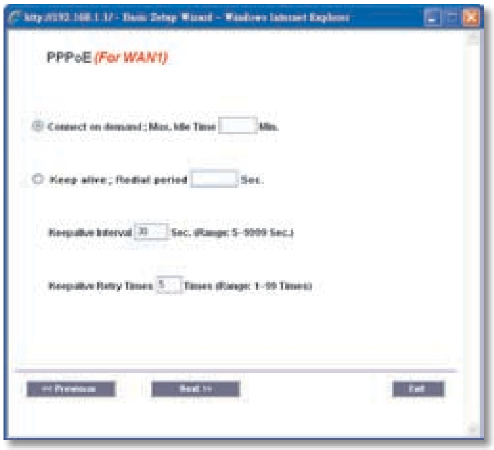
Password :

PPPoE

Select **Connect on demand** or **Keep alive**. If you select the Connect on demand option, the connection will be disconnected after a specified period of inactivity (Max Idle Time). If you have been disconnected due to inactivity, Connect on Demand enables the Router to automatically re-establish your connection as soon as you attempt to access the Internet again. Enter the number of minutes you want to have elapsed before your Internet access disconnects. The default is **5** minutes.

If you select the Keep alive option, the Router will keep the connection alive by sending out a few data packets periodically, so your ISP thinks that the connection is still active. This option keeps your connection active indefinitely, even when it sits idle. The default Redial Period is **30** seconds. The default Keepalive Interval is **30** seconds. The default Keepalive Retry Times is **5** times.

Click **Next** to continue, and proceed to step 6. Click **Previous** if you want to return to the previous screen. Click **Exit** if you want to exit the Setup Wizard.


http://192.168.1.1/ - Basic Setup Wizard - Windows Internet Explorer

PPPoE *(For WAN1)*

● Connect on demand : Max. Idle Time Min.

○ Keep alive ; Redial period Sec.

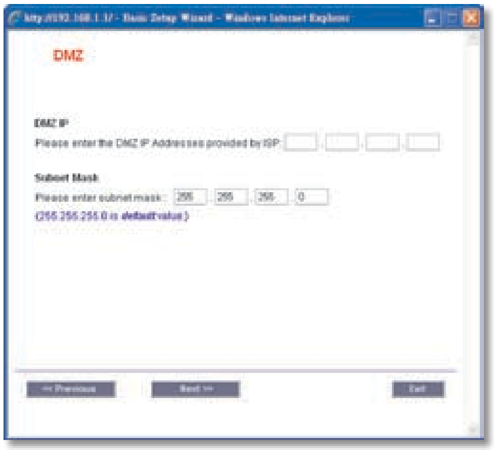
Keepalive Interval 30 Sec. (Range: 5-9999 Sec.)

Keepalive Retry Times 5 Times (Range: 1-99 Times)

Connect on Demand or Keep Alive

6. To set up the WAN2 port as a WAN (Internet) port, repeat step 5. To set up the WAN2 port as a DMZ port, go to step 7.
7. Complete the *DMZ IP* and *Subnet Mask* fields with the information provided by your ISP.

   Click **Next** to continue, and proceed to step 8. Click **Previous** if you want to return to the previous screen. Click **Exit** if you want to exit the Setup Wizard.


http://192.168.1.1/ - Basic Setup Wizard - Windows Internet Explorer

DMZ

DMZ IP

Please enter the DMZ IP Addresses provided by ISP: . . .

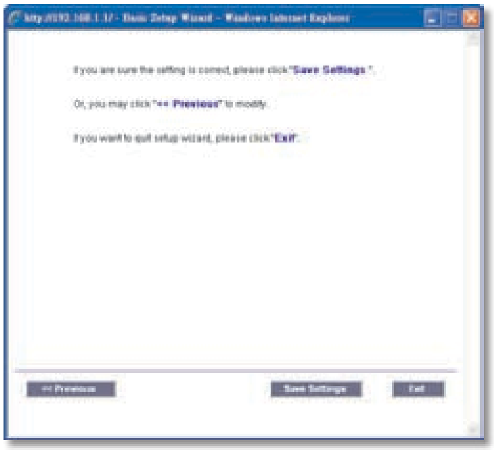
Subnet Mask

Please enter subnet mask: 255 . 255 . 255 . 0

(255.255.255.0 is **default value**)

DMZ

8. If you want to save your changes, click **Save Settings**. Click **Previous** if you want to return to the previous screen. Click **Exit** if you want to exit the Setup Wizard.


http://192.168.1.1/ - Basic Setup Wizard - Windows Internet Explorer
<< Previous
Save Settings
Exit

If you are sure the setting is correct, please click "Save Settings".

Or, you may click "<< Previous" to modify.

If you want to quit setup wizard, please click "Exit".

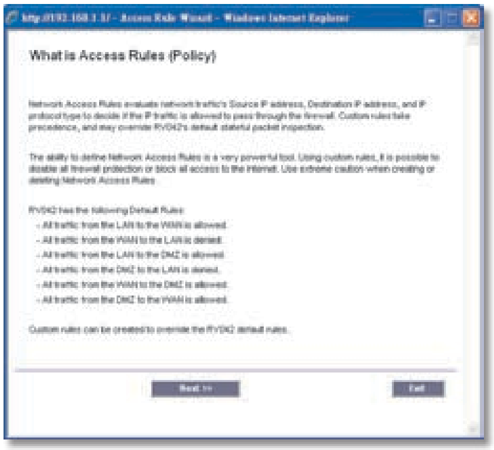
Save Settings

9. A screen appears to notify you that the settings have been saved. To proceed to the *Wizard* screen, click **OK**. To proceed to the *System* > *Network* screen, click **Cancel**.

Access Rule Setup

1. Click **Launch Now** to run the Access Rule Setup Wizard.

2. This screen explains the Access Rules, including the Router's Default Rules. Click **Next** to continue. Click **Exit** if you want to exit the Setup Wizard.


http://192.168.1.1/ - Access Rule Wizard - Windows Internet Explorer
Next >>
Exit

What is Access Rules (Policy)

Network Access Rules evaluate network traffic's Source IP address, Destination IP address, and IP protocol type to decide if the IP traffic is allowed to pass through the firewall. Custom rules take precedence, and may override RV042's default stateful packet inspection.

The ability to define Network Access Rules is a very powerful tool. Using custom rules, it is possible to disable all firewall protection or block all access to the Internet. Use extreme caution when creating or deleting Network Access Rules.

RV042 has the following Default Rules:

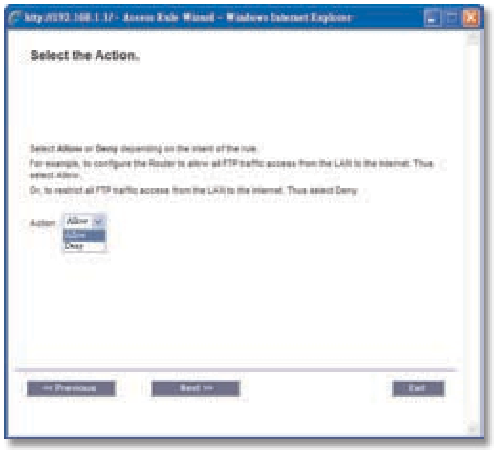
- All traffic from the LAN to the WAN is allowed.
- All traffic from the WAN to the LAN is denied.
- All traffic from the LAN to the DMZ is allowed.
- All traffic from the DMZ to the LAN is denied.
- All traffic from the WAN to the DMZ is allowed.
- All traffic from the DMZ to the WAN is allowed.

Custom rules can be created to override the RV042 default rules.

Access Rules Policy

3. From the drop-down menu, select **Allow** or **Deny** depending on the intent of the Access Rule.

   Click **Next** to continue. Click **Previous** if you want to return to the previous screen. Click **Exit** if you want to exit the Setup Wizard.


http://192.168.1.1/ - Access Rule Wizard - Windows Internet Explorer
Allow
Deny
<< Previous
Next >>
Exit

Select the Action.

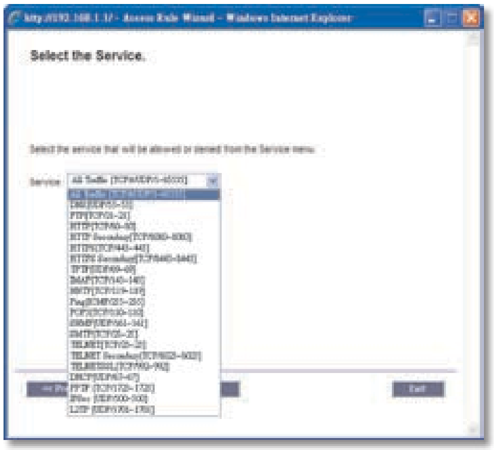
Select Allow or Deny depending on the intent of the rule.
For example, to configure the Router to allow all FTP traffic access from the LAN to the Internet. Thus select Allow.
Or, to restrict all FTP traffic access from the LAN to the Internet. Thus select Deny.

Action: Allow

Select the Action

4. Select the service you want from the *Service* pull-down menu.

   Click **Next** to continue. Click **Previous** if you want to return to the previous screen. Click **Exit** if you want to exit the Setup Wizard.



Select the Service.

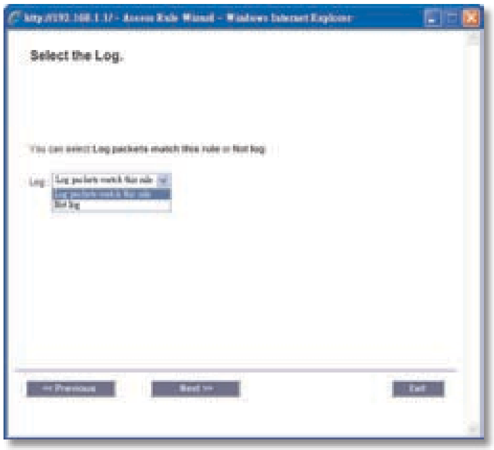
Select the service that will be allowed or denied from the Service menu.

Service: All Traffic [TCP&UDP/1~65535]

Select the Service

5. For this service, you can select whether or not you want the Router to keep a log tracking this type of activity. To keep a log, select **Log packets match this rule**. If you do not want a log, select **Not log**.

   Click **Next** to continue. Click **Previous** if you want to return to the previous screen. Click **Exit** if you want to exit the Setup Wizard.


http://192.168.1.1/ - Access Rule Wizard - Windows Internet Explorer
<< Previous
Next >>
Exit

Select the Log.

You can select Log packets match this rule or Not log

Log: Log packets match this rule

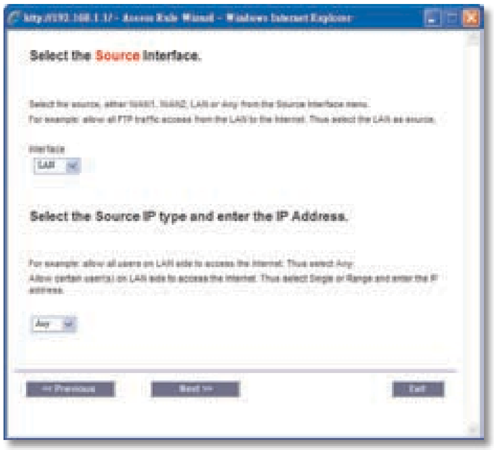
Log packets match this rule
Not log

Select the Log Rule

6. Select the Source Interface: **LAN**, **WAN1**, **WAN2**, or **Any** from the *Interface* pull-down menu.

   Select the Source IP address(es) for this Access Rule. If it can be any IP address, select **Any**. If it is one IP address, select **Single** and enter the IP address. If it is a range of IP addresses, select **Range**, and enter the range of IP addresses.

   Click **Next** to continue. Click **Previous** if you want to return to the previous screen. Click **Exit** if you want to exit the Setup Wizard.


http://192.168.1.1/ - Access Rule Wizard - Windows Internet Explorer
<< Previous
Next >>
Exit

Select the Source Interface.

Select the source, either WAN1, WAN2, LAN or Any from the Source Interface menu.
For example: allow all FTP traffic access from the LAN to the Internet. Thus select the LAN as source.

Interface: LAN

Select the Source IP type and enter the IP Address.

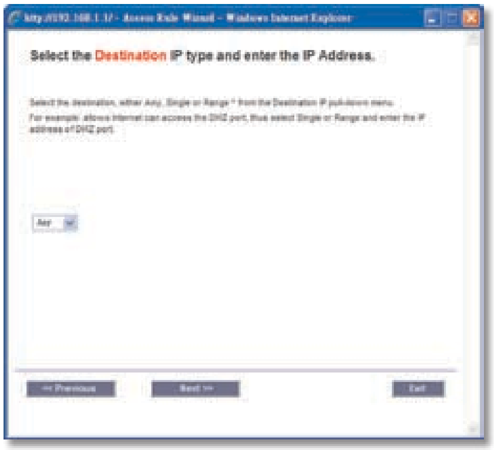
For example: allow all users on LAN side to access the Internet. Thus select Any.
Allow certain user(s) on LAN side to access the Internet. Thus select Single or Range and enter the IP address.

Any

Select the Source

7. Select the Destination IP address(es) for this Access Rule. If it can be any IP address, select **Any**. If it is one IP address, select **Single** and enter the IP address. If it is a range of IP addresses, select **Range**, and enter the range of IP addresses.

   Click **Next** to continue. Click **Previous** if you want to return to the previous screen. Click **Exit** if you want to exit the Setup Wizard.


http://192.168.1.1/ - Access Rule Wizard - Windows Internet Explorer
<< Previous
Next >>
Exit

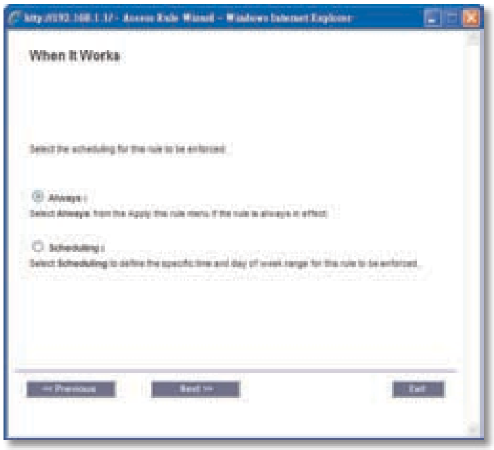
Select the Destination IP type and enter the IP Address.

Select the destination, either Any, Single or Range * from the Destination IP pull-down menu.
For example: allows Internet can access the DMZ port, thus select Single or Range and enter the IP address of DMZ port.

Any

Select the Destination

8. Decide when you want this Access Rule to be enforced. Select **Always** if you want the Access Rule to be always enforced, or select **Scheduling** if you want to specify when the Access Rule should be in effect.


http://192.168.1.1/ - Access Rule Wizard - Windows Internet Explorer
<< Previous
Next >>
Exit

When It Works

Select the scheduling for the rule to be enforced.

● Always :
Select Always from the Apply this rule menu if the rule is always in effect.

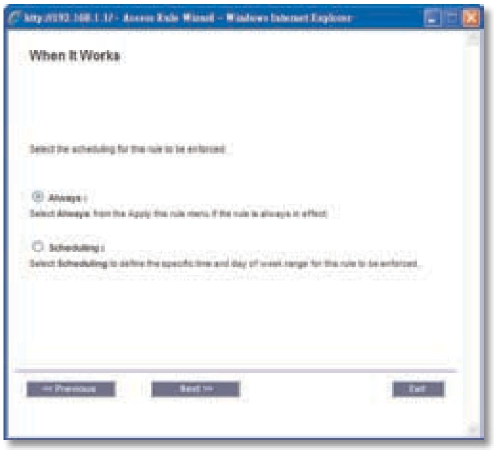
○ Scheduling :
Select Scheduling to define the specific time and day of week range for the rule to be enforced.

When It Works

   If you selected Always, click **Next** to continue. Click **Previous** if you want to return to the previous screen. Click **Exit** if you want to exit the Setup Wizard.

   If you selected Scheduling, click **Next** to continue. A new screen appears. Decide what times and which days of the week the Access Rule should be enforced. Then enter the hours and minutes in 24-hour format, and select the appropriate days of the week. Click

Next to continue. Click **Previous** if you want to return to the previous screen. Click **Exit** if you want to exit the Setup Wizard.



When It Works

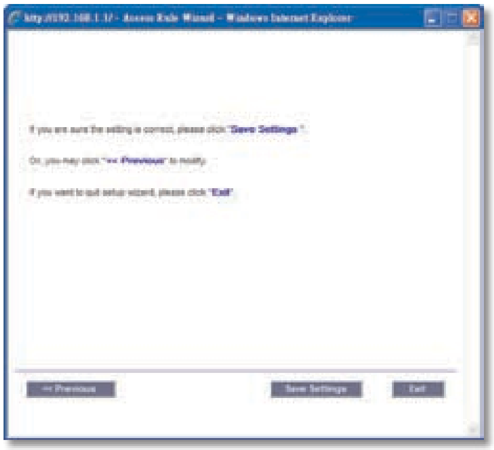
Select the scheduling for the rule to be enforced.

○ Always :
Select Always from the Apply this rule menu if the rule is always in effect.

○ Scheduling :
Select Scheduling to define the specific time and day of week range for the rule to be enforced.

When It Works

9. If you want to save your changes, click **Save Settings**. Click **Previous** if you want to return to the previous screen. Click **Exit** if you want to exit the Setup Wizard.



If you are sure the setting is correct, please click "Save Settings".

Or, you may click "<< Previous" to modify.

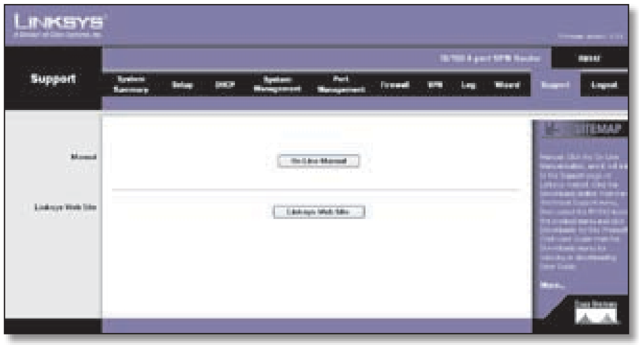
If you want to quit setup wizard, please click "Exit".

Save Settings

10. A screen appears to notify you that the settings have been saved. If you want to add another Access Rule, click **OK**, and the first screen of the Access Rule Setup Wizard will appear. If you want to exit the Access Rule Setup Wizard, click **Cancel**, and the *Firewall > Access Rules* screen will appear.

Support

Access a variety of resources on the Support page of the Linksys website, www.linksys.com. You must have an active Internet connection before you can visit the Linksys website.



Support

Manual

If you want the latest version of this User Guide, click **On Line Manual**. The Support page of the Linksys website appears.

Follow the on-screen instructions to access the Downloads page for the 10/100 4-Port VPN Router (model number: RV042).

After downloading the user guide to your computer, open it using Adobe Reader.

Linksys Web Site

Click **Linksys Web Site**, and the Support page of the Linksys website appears.

Logout

The Logout tab is located on the upper right-hand corner of the screen. Click this tab to exit the web-based utility. (If you exit the web-based utility, you will need to re-enter your User Name and Password to log in and then manage the Router.)

Appendix A: Troubleshooting

The firmware upgrade has failed.

A firmware upgrade takes approximately ten minutes. An error may occur if you powered off the Router, pressed the Reset button, closed the *System Management > Firmware Upgrade* screen, or disconnected the computer from the Router during the firmware upgrade.

If the firmware upgrade failed, repeat the firmware upgrade procedure using the *System Management > Firmware Upgrade* screen of the web-based utility. Refer to "Appendix F: Firmware Upgrade" for details.

If the Diag LED continues to flash, the firmware image is damaged. Use the TFTP utility to upgrade the firmware. You can download the TFTP utility at www.linksys.com.

Your computer cannot connect to the Internet.

Follow these instructions until your computer can connect to the Internet:

- Make sure that the Router is powered on. The System LED should be green and not flashing.
- If the System LED is flashing, then power off all of your network devices, including the modem, Router, and computers. Then power on each device in the following order:
  1. Cable or DSL modem
  2. Router
  3. Computer
- Check the cable connections. The computer should be connected to one of the ports numbered 1-4 on the Router, and the modem must be connected to the Internet port on the Router.

The DSL telephone line does not fit into the Router's Internet port.

The Router does not replace your modem. You still need your DSL modem in order to use the Router. Connect the telephone line to the DSL modem, insert the setup CD into your computer, and then follow the on-screen instructions.

The Router does not have a coaxial port for the cable connection.

The Router does not replace your modem. You still need your cable modem in order to use the Router. Connect your cable connection to the cable modem, insert the setup CD into your computer, and then follow the on-screen instructions.

WEB: If your questions are not addressed here, refer to the Linksys website, **www.linksys.com**.

Appendix B: Linksys QuickVPN for Windows 2000, XP, or Vista

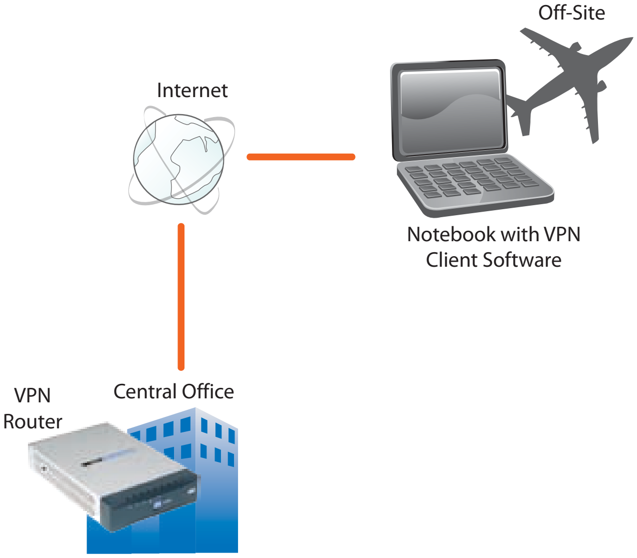
Introduction

The 10/100 4-Port VPN Router (model number: RV042) supports IPSec VPN client software, including the Linksys QuickVPN software (also known as the Linksys VPN client).

The Router supports up to 50 Linksys QuickVPN clients free of charge. If the Router you have only supports up to ten clients, then upgrade its firmware. Refer to "Appendix F: Firmware Upgrade" for instructions.

Computer (using VPN client software) to VPN Router

You can create a VPN tunnel between a computer using VPN client software and a VPN router. The following is an example of a computer-to-VPN Router VPN. In her hotel room, a traveling businesswoman connects to her Internet Service Provider (ISP). Her notebook computer has VPN client software that is configured with her office's VPN settings. She accesses the VPN client software and connects to the VPN Router at the central office. As VPNs use the Internet, distance is not a factor. Using the VPN, the businesswoman now has a secure connection to the central office's network, as if she were physically connected.



Computer to VPN Router

Linksys QuickVPN Instructions

This appendix has two sections. The first section explains how to do the following for each QuickVPN client, using the Router's web-based utility:

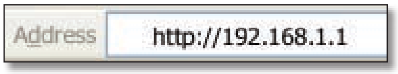
1. Export a client certificate.
2. Configure a user name and password.
3. Add the QuickVPN client to the list.

The second section explains how to install and use Linksys QuickVPN, which works on computers running Windows 2000, XP, or Vista. (Computers using other operating systems will have to use third-party VPN software.) For Windows Vista, QuickVPN version 1.2.5 or later is required.

Router Configuration

Export a Client Certificate from the Router

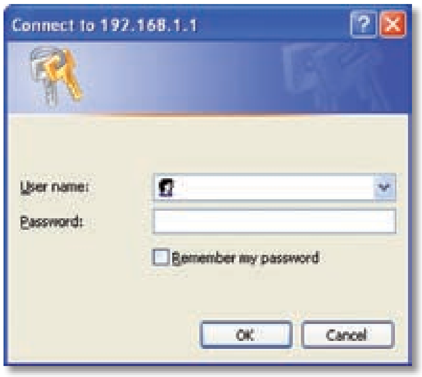
1. For local access of the Router's web-based utility, launch your web browser, and enter the Router's default IP address, **192.168.1.1**, in the *Address* field. Press the **Enter** key.


Address http://192.168.1.1

Address Bar

NOTE: If the Remote Management feature on the *Firewall* > *General* screen has been enabled, then users with administrative privileges can remotely access the web-based utility. Use **http://<WAN IP address of the Router>**, or use **https://<WAN IP address of the Router>** if you have enabled the HTTPS feature.

2. A login screen prompts you for your User name and Password. Enter **admin** in the *User name* field, and enter **admin** in the *Password* field. (You can change the Password on the *Setup* > *Password* screen.) Then click **OK**.


Connect to 192.168.1.1

User name:

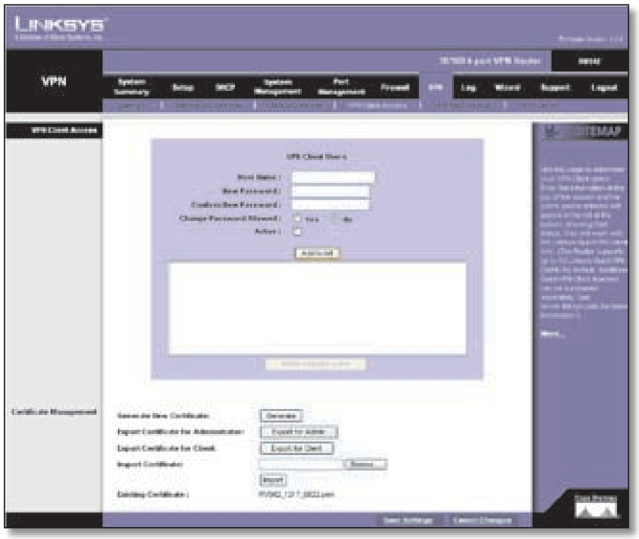
Password:

□ Remember my password

OK Cancel

Login Screen

3. In the Router's web-based utility, click the **VPN** tab.
4. Click the **VPN Client Access** tab.
5. Click **Generate** to generate a new certificate (if needed).

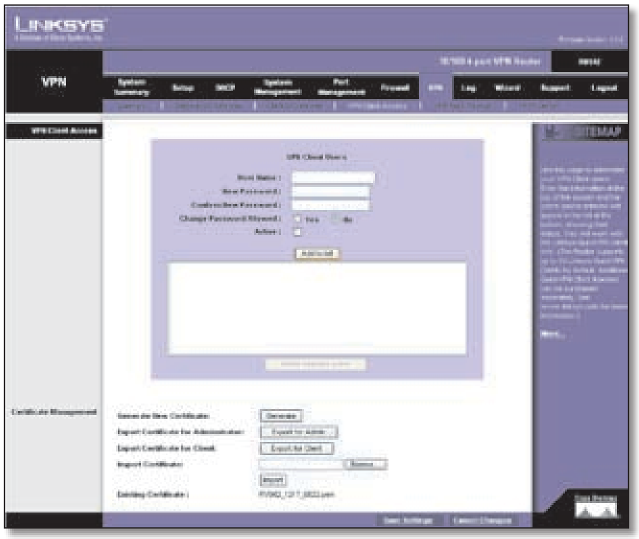


VPN Client Access Screen

6. To export a client certificate, click **Export for Client** and save the certificate as a **.pem** file.
7. Distribute the certificate to all QuickVPN users.

Add VPN Client Users

For each QuickVPN client, repeat steps 1-6.



VPN Client Access Screen

1. On the *VPN Client Access* screen, enter the user name in the *User Name* field.
2. Enter the password in the *New Password* field, and enter it again in the *Confirm New Password* field.
3. For the Change Password Allowed setting, select **Yes** to allow the user to change his or her password. Otherwise, keep the default, **No**.
4. To activate the new user, select **Active**.
5. Click **Add to list**.
6. Click **Save Settings**.

NOTE: If the Router's LAN IP address is the default, 192.168.1.1, then a pop-up window will appear when you first save these settings. You will be asked if you want the Router to automatically change its LAN IP address to prevent conflicting IP addresses. To allow the Router to change its LAN IP address, click **Yes**.

If there is an IP address conflict, the QuickVPN client will not be able to connect to the Router.

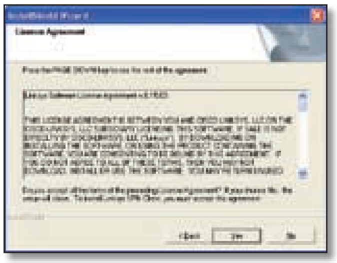
Linksys QuickVPN Client Installation and Configuration

For each QuickVPN client, do the following:

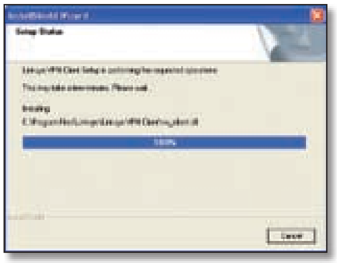
1. Install Linksys QuickVPN. (Use the appropriate installation procedure, "Install from the CD" or "Download from the Internet".)
2. Install the client certificate.

Install from the CD-ROM

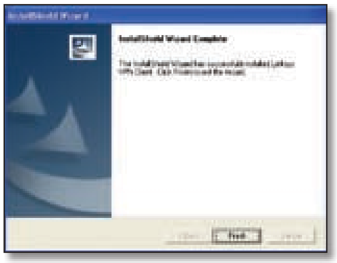
1. Insert the RV042 CD-ROM into your CD-ROM drive. Click **Start** and then click **Run**. In the field provided, enter **D:\VPN_Client.exe** (if "**D**" is the letter of your CD-ROM drive).
2. The *License Agreement* screen appears. Read the agreement. Click **Yes** to accept the terms and conditions, and then the appropriate files are copied to the computer. Clicking the **Back** or **No** button will close the window, and the software will not be installed on the computer.



License Agreement



Copying Files

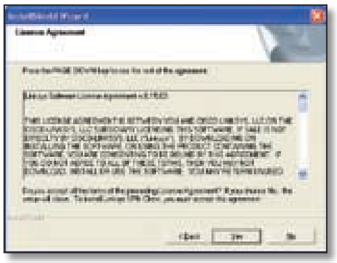


Installation Complete

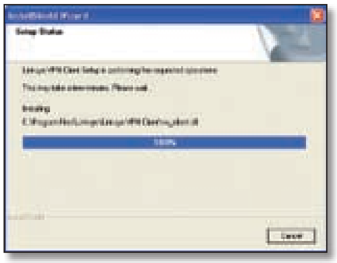
3. Click **Finish** to complete the installation. Proceed to the section, "Install the Client Certificate".

Download from the Internet

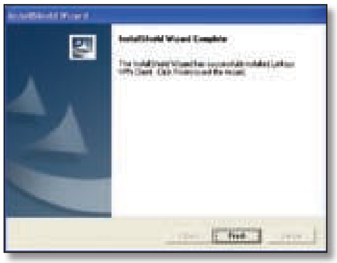
1. Go to **www.linksys.com** and select **Products**.
2. Click **Business**.
3. Click **Router/VPN Solutions**.
4. Click **RV042**.
5. Click **Linksys QuickVPN Utility** in the More Information section.
6. Select the version number of the Router.
7. Save the zip file to your computer, and extract the .exe file.
8. Double-click the .exe file.
9. The *License Agreement* screen appears. Read the agreement. Click **Yes** to accept the terms and conditions, and then the appropriate files are copied to the computer. Clicking the **Back** or **No** button will close the window, and the software will not be installed on the computer.



License Agreement



Copying Files



Installation Complete

10. Click **Finish** to complete the installation. Proceed to the section, "Install the Client Certificate".

Install the Client Certificate

For each QuickVPN client, save the client certificate to the directory where the QuickVPN program is installed. Example: **C:\Program Files\Linksys\QuickVPN Client**

NOTE: The certificate for the client must be placed in the install directory of the QuickVPN client software.

Proceed to the section, "Use of the Linksys QuickVPN Software".

Use of the Linksys QuickVPN Software

For each QuickVPN client, follow the instructions in the section, "Linksys QuickVPN Connection".

Linksys QuickVPN Connection

1. Double-click the Linksys QuickVPN software icon on your desktop or in the system tray.

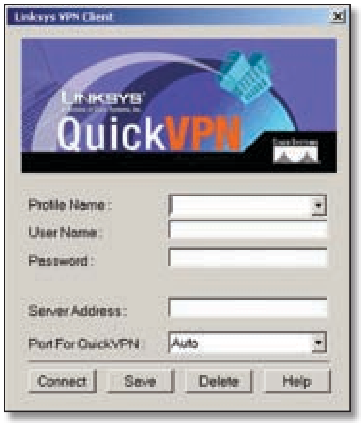
QuickVPN Desktop Icon

QuickVPN Tray Icon—
No Connection

2. The *QuickVPN Login* screen appears. Enter the following:

- **Profile Name** Enter a name for your profile.
- **User Name** Enter the User Name assigned to you.

- **Password** Enter the Password assigned to you.
- **Server Address** Enter the IP address or domain name of the Linksys 10/100 4-Port VPN Router.
- **Port for QuickVPN** Enter the port number that the QuickVPN client will use to communicate with the remote VPN router, or keep the default, **Auto**.



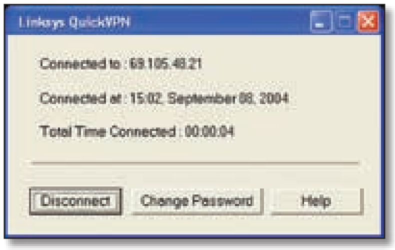
Port For QuickVPN : Auto

QuickVPN Login

To save this profile, click **Save**. (If there are multiple sites to which you will need to create a tunnel, you can create multiple profiles, but note that only one tunnel can be active at a time.) To delete this profile, click **Delete**. For information, click **Help**.

3. To begin your QuickVPN connection, click **Connect**. The connection's progress is displayed in this order: *Connecting*, *Provisioning*, *Activating Policy*, and *Verifying Network*.
4. When your QuickVPN connection is established, the QuickVPN tray icon turns green, and the *QuickVPN Status* screen appears. The screen displays the IP address of the remote end of the VPN tunnel, the time and date the VPN tunnel began, and the total length of time the VPN tunnel has been active.

QuickVPN Tray Icon—Connection



Connected to : 69.105.48.21

Connected at : 15:02, September 08, 2004

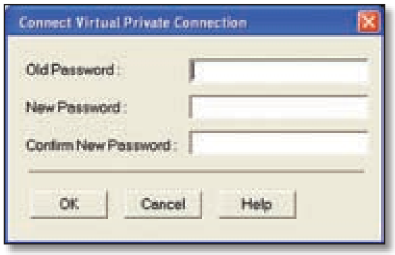
Total Time Connected : 00:00:04

QuickVPN Status

To terminate the VPN tunnel, click **Disconnect**. To change your password, click **Change Password**. For information, click **Help**.

If you clicked Change Password and have permission to change your own password, the *Connect Virtual Private Connection* screen appears.

- **Old Password** Enter your password.
- **New Password** Enter your new password.
- **Confirm New Password** Re-enter your new password.



Connect Virtual Private Connection

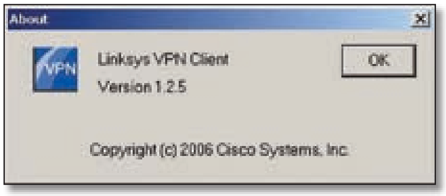
Click **OK** to save your new password. Click **Cancel** to cancel your change. For information, click **Help**.

NOTE: You can change your password only if you have been granted that privilege by your system administrator.

Version Number of Linksys QuickVPN

To display the version number of Linksys QuickVPN:

1. Right-click the QuickVPN tray icon, and select **About**.
2. The *About* screen displays the QuickVPN version number.



Linksys VPN Client
Version 1.2.5

Copyright (c) 2006 Cisco Systems, Inc.

QuickVPN Version Number

3. Click **OK** to close the *About* screen.

Appendix C: Gateway-to-Gateway VPN Tunnel

Overview

This appendix explains how to configure an IPSec VPN tunnel between two VPN Routers, using an example. Two computers are used to test the liveliness of the tunnel.

Before You Begin

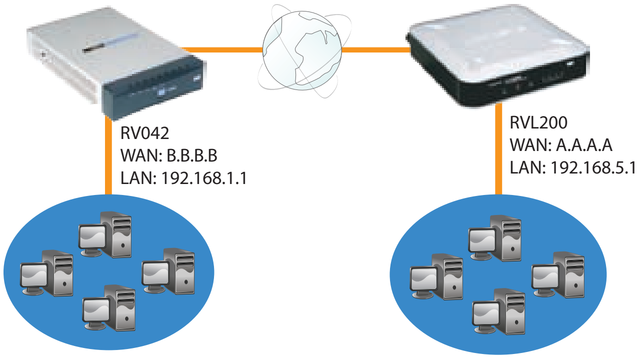
The following is a list of equipment you need:

- Two Windows desktop computers (each computer will be connected to a VPN Router)
- Two VPN Routers that are both connected to the Internet

Any VPN Routers can be deployed; however, this example uses the 4-Port SSL/IPSec VPN Router (model number: RVL200) and the 10/100 4-Port VPN Router (model number: RV042).

Configuration when the Remote Gateway Uses a Static IP Address

This example assumes the Remote Gateway is using a static IP address. If the Remote Gateway uses a dynamic IP address, refer to "Configuration when the Remote Gateway Uses a Dynamic IP Address."



Gateway-to-Gateway IPSec VPN Tunnel - Remote Gateway Using Static IP

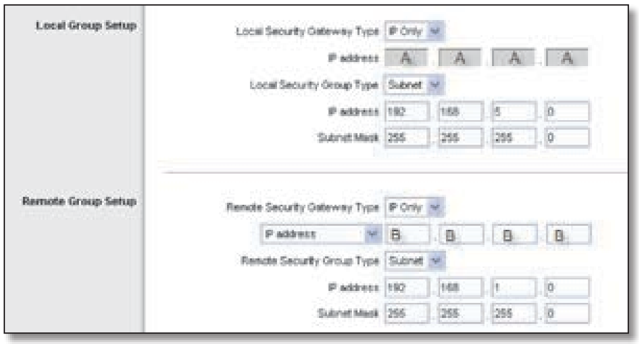
NOTE: Each computer must have a network adapter installed.

Configuration of the RVL200

Follow these instructions for the first VPN Router, designated RVL200. The other VPN Router is designated the RV042.

1. Launch the web browser for a networked computer, designated PC 1.
2. Access the web-based utility of the RVL200. (Refer to the User Guide of the RVL200 for details.)
3. Click the **IPSec VPN** tab.
4. Click the **Gateway to Gateway** tab.
5. Enter a name in the *Tunnel Name* field.
6. For the VPN Tunnel setting, select **Enable**.
7. For the Local Security Gateway Type, select **IP Only**. The WAN IP address (A.A.A.A) of the RVL200 will be automatically detected.

   For the Local Security Group Type, select **Subnet**. Enter the RVL200's local network settings in the *IP Address* and *Subnet Mask* fields.



Local Group Setup

Local Security Gateway Type: IP Only

IP address: A . A . A . A

Local Security Group Type: Subnet

IP address: 192 . 168 . 5 . 0

Subnet Mask: 255 . 255 . 255 . 0

Remote Group Setup

Remote Security Gateway Type: IP Only

IP address: B . B . B . B

Remote Security Group Type: Subnet

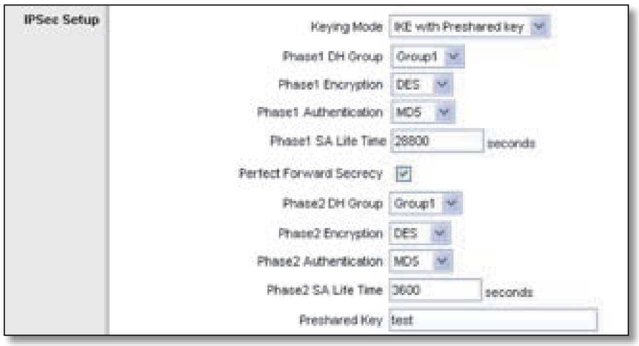
IP address: 192 . 168 . 1 . 0

Subnet Mask: 255 . 255 . 255 . 0

RVL200 IPSec VPN Settings

8. For the Remote Security Gateway Type, select **IP Only**. Enter the RV042's WAN IP address in the *IP Address* field.
9. For the Remote Security Group Type, select **Subnet**. Enter the RV042's local network settings in the *IP Address* and *Subnet Mask* fields.
10. In the IPSec Setup section, select the appropriate encryption, authentication, and other key management settings.

11. In the *Preshared Key* field, enter a string for this key, for example, 13572468.



IPSec Setup

Keying Mode: IKE with Preshared key
Phase1 DH Group: Group1
Phase1 Encryption: DES
Phase1 Authentication: MD5
Phase1 SA Life Time: 28800 seconds
Perfect Forward Secrecy: ☑
Phase2 DH Group: Group1
Phase2 Encryption: DES
Phase2 Authentication: MD5
Phase2 SA Life Time: 3600 seconds
Preshared Key: test

RVL200 IPSec Setup Settings

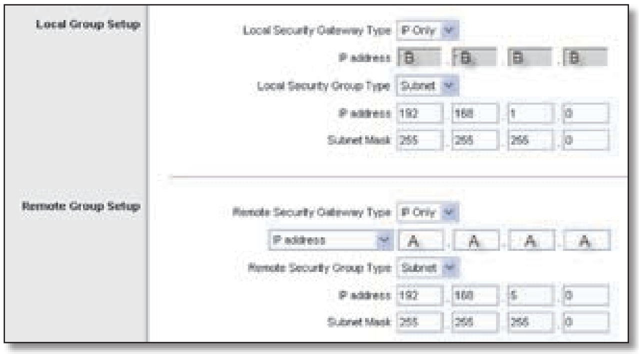
12. If you need more detailed settings, click **Advanced Settings**. Otherwise, click **Save Settings** and proceed to the next section, "Configuration of the RV042."

Configuration of the RV042

Follow similar instructions for the RV042.

1. Launch the web browser for a networked computer, designated PC 2.
2. Access the web-based utility of the RV042. (Refer to "Chapter 4: Advanced Configuration" for details.)
3. Click the **VPN** tab.
4. Click the **Gateway to Gateway** tab.
5. Enter a name in the *Tunnel Name* field.
6. Select the appropriate Interface, **WAN1** or **WAN2**.
7. Select **Enable**.
8. For the Local Security Gateway Type, select **IP Only**. The WAN IP address (B.B.B.B) of the RV042 will be automatically detected.

   For the Local Security Group Type, select **Subnet**. Enter the RV042's local network settings in the *IP Address* and *Subnet Mask* fields.



Local Group Setup

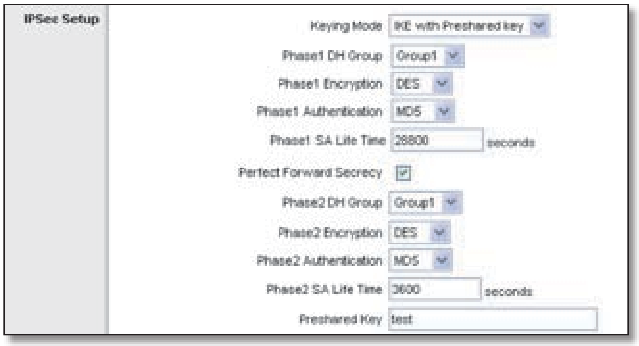
Local Security Gateway Type: IP Only
IP address: B . B . B . B
Local Security Group Type: Subnet
IP address: 192 . 168 . 1 . 0
Subnet Mask: 255 . 255 . 255 . 0

Remote Group Setup

Remote Security Gateway Type: IP Only
IP address: A . A . A . A
Remote Security Group Type: Subnet
IP address: 192 . 168 . 5 . 0
Subnet Mask: 255 . 255 . 255 . 0

RV042 VPN Settings

9. For the Remote Security Gateway Type, select **IP Only**. Enter the RVL200's WAN IP address in the *IP Address* field.
10. For the Remote Security Group Type, select **Subnet**. Enter the RVL200's local network settings in the *IP Address* and *Subnet Mask* fields.
11. In the IPSec Setup section, select the appropriate encryption, authentication, and other key management settings. (These should match the settings of the RVL200.)
12. In the *Preshared Key* field, enter a string for this key, for example, 13572468.



IPSec Setup

Keying Mode: IKE with Preshared key
Phase1 DH Group: Group1
Phase1 Encryption: DES
Phase1 Authentication: MD5
Phase1 SA Life Time: 28800 seconds
Perfect Forward Secrecy: ☑
Phase2 DH Group: Group1
Phase2 Encryption: DES
Phase2 Authentication: MD5
Phase2 SA Life Time: 3600 seconds
Preshared Key: test

RV042 IPSec Setup Settings

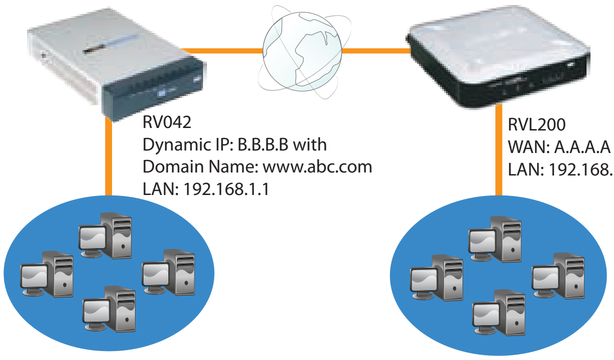
13. If you need more detailed settings, click **Advanced**. Otherwise, click **Save Settings**.

Configuration of PC 1 and PC 2

Verify that PC 1 and PC 2 can ping each other (refer to Windows Help for more information). If they can ping each other, then the VPN tunnel is configured correctly.

Configuration when the Remote Gateway Uses a Dynamic IP Address

This example assumes the Remote Gateway is using a dynamic IP address. If the Remote Gateway uses a static IP address, refer to "Configuration when the Remote Gateway Uses a Static IP Address."



Gateway-to-Gateway IPSec VPN Tunnel - Remote Gateway Using Dynamic IP

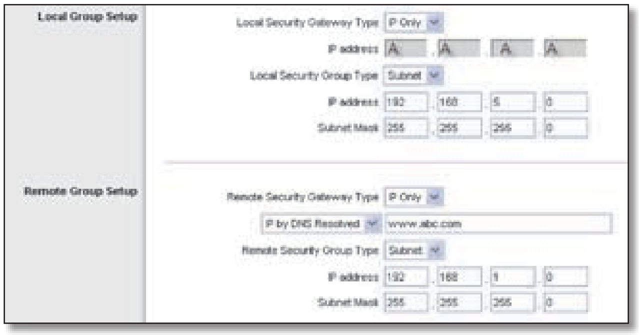
NOTE: Each computer must have a network adapter installed.

Configuration of the RVL200

Follow these instructions for the first VPN Router, designated RVL200. The other VPN Router is designated the RV042.

1. Launch the web browser for a networked computer, designated PC 1.
2. Access the web-based utility of the RVL200. (Refer to the User Guide of the RVL200 for details.)
3. Click the **IPSec VPN** tab.
4. Click the **Gateway to Gateway** tab.
5. Enter a name in the *Tunnel Name* field.
6. For the VPN Tunnel setting, select **Enable**.
7. For the Local Security Gateway Type, select **IP Only**. The WAN IP address (A.A.A.A) of the RVL200 will be automatically detected.

   For the Local Security Group Type, select **Subnet**. Enter the RVL200's local network settings in the *IP Address* and *Subnet Mask* fields.



Local Group Setup

Local Security Gateway Type: IP Only

IP address: A . A . A . A

Local Security Group Type: Subnet

IP address: 192 . 168 . 5 . 0

Subnet Mask: 255 . 255 . 255 . 0

Remote Group Setup

Remote Security Gateway Type: IP Only

IP by DNS Resolved: www.abc.com

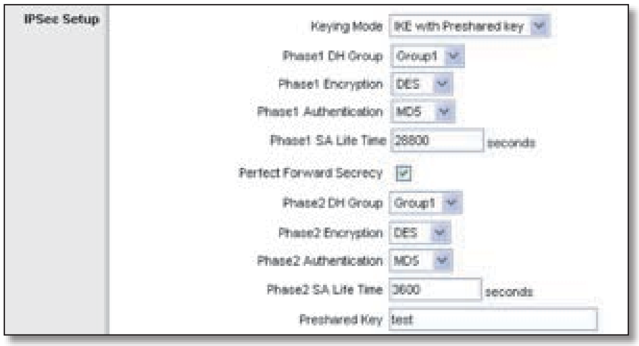
Remote Security Group Type: Subnet

IP address: 192 . 168 . 1 . 0

Subnet Mask: 255 . 255 . 255 . 0

RVL200 IPSec VPN Settings

8. For the Remote Security Gateway Type, select **IP Only**. Then select **IP by DNS Resolved**. Enter the RV042's domain name in the field provided.
9. For the Remote Security Group Type, select **Subnet**. Enter the RV042's local network settings in the *IP Address* and *Subnet Mask* fields.
10. In the IPSec Setup section, select the appropriate encryption, authentication, and other key management settings.
11. In the *Preshared Key* field, enter a string for this key, for example, 13572468.



IPSec Setup

Keying Mode: IKE with Preshared key

Phase1 DH Group: Group1

Phase1 Encryption: DES

Phase1 Authentication: MD5

Phase1 SA Life Time: 28800 seconds

Perfect Forward Secrecy: ☑

Phase2 DH Group: Group1

Phase2 Encryption: DES

Phase2 Authentication: MD5

Phase2 SA Life Time: 3600 seconds

Preshared Key: test

RVL200 IPSec Setup Settings

12. If you need more detailed settings, click **Advanced Settings**. Otherwise, click **Save Settings** and proceed to the next section, "Configuration of the RV042."

Configuration of the RV042

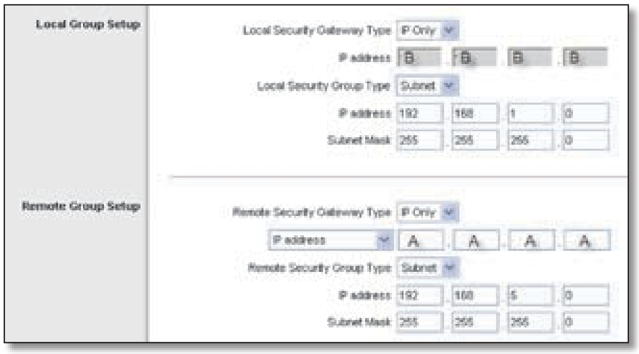
Follow similar instructions for the RV042.

1. Launch the web browser for a networked computer, designated PC 2.
2. Access the web-based utility of the RV042. (Refer to "Chapter 4: Advanced Configuration" for details.)
3. Click the **VPN** tab.
4. Click the **Gateway to Gateway** tab.
5. Enter a name in the *Tunnel Name* field.
6. Select the appropriate Interface, **WAN1** or **WAN2**.

7. Select **Enable**.

8. For the Local Security Gateway Type, select **IP Only**. The WAN IP address (B.B.B.B) of the RV042 will be automatically detected.

   For the Local Security Group Type, select **Subnet**. Enter the RV042's local network settings in the *IP Address* and *Subnet Mask* fields.



Local Group Setup
Local Security Gateway Type: IP Only
IP address: B . B . B . B
Local Security Group Type: Subnet
IP address: 192 . 168 . 1 . 0
Subnet Mask: 255 . 255 . 255 . 0

Remote Group Setup
Remote Security Gateway Type: IP Only
IP address: A . A . A . A
Remote Security Group Type: Subnet
IP address: 192 . 168 . 5 . 0
Subnet Mask: 255 . 255 . 255 . 0

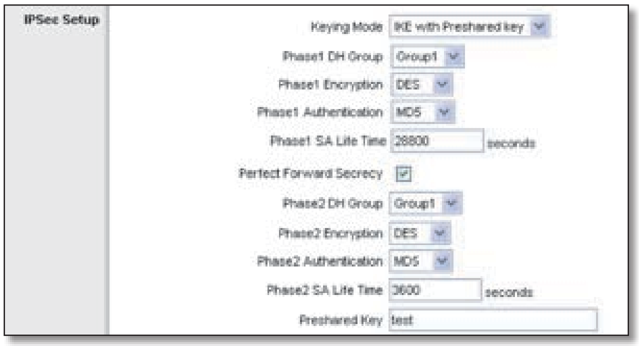
RV042 VPN Settings

9. For the Remote Security Gateway Type, select **IP Only**. Enter the RVL200's WAN IP address in the *IP Address* field.

10. For the Remote Security Group Type, select **Subnet**. Enter the RVL200's local network settings in the *IP Address* and *Subnet Mask* fields.

11. In the IPSec Setup section, select the appropriate encryption, authentication, and other key management settings. (These should match the settings of the RVL200.)

12. In the *Preshared Key* field, enter a string for this key, for example, 13572468.



IPSec Setup
Keying Mode: IKE with Preshared key
Phase1 DH Group: Group1
Phase1 Encryption: DES
Phase1 Authentication: MD5
Phase1 SA Life Time: 28800 seconds
Perfect Forward Secrecy: ☑
Phase2 DH Group: Group1
Phase2 Encryption: DES
Phase2 Authentication: MD5
Phase2 SA Life Time: 3600 seconds
Preshared Key: test

RV042 IPSec Setup Settings

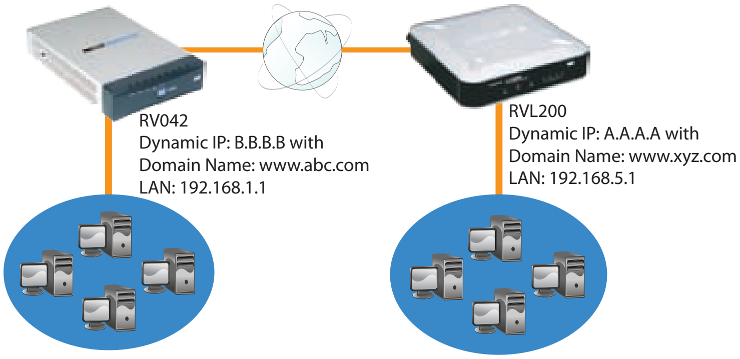
13. If you need more detailed settings, click **Advanced Settings**. Otherwise, click **Save Settings**.

Configuration of PC 1 and PC 2

Verify that PC 1 and PC 2 can ping each other (refer to Windows Help for more information). If they can ping each other, then the VPN tunnel is configured correctly.

Configuration when Both Gateways Use Dynamic IP Addresses

This example assumes both Gateways are using dynamic IP addresses. If the Remote Gateway uses a static IP address, refer to "Configuration when the Remote Gateway Uses a Static IP Address." If only the Remote Gateway uses a dynamic IP address, refer to "Configuration when the Remote Gateway Uses a Dynamic IP Address."



Gateway-to-Gateway IPSec VPN Tunnel - Both Gateways Using Dynamic IP

NOTE: Each computer must have a network adapter installed.

Configuration of the RVL200

Follow these instructions for the first VPN Router, designated RVL200. The other VPN Router is designated the RV042.

1. Launch the web browser for a networked computer, designated PC 1.

2. Access the web-based utility of the RVL200. (Refer to the User Guide of the RVL200 for details.)

3. Click the **IPSec VPN** tab.

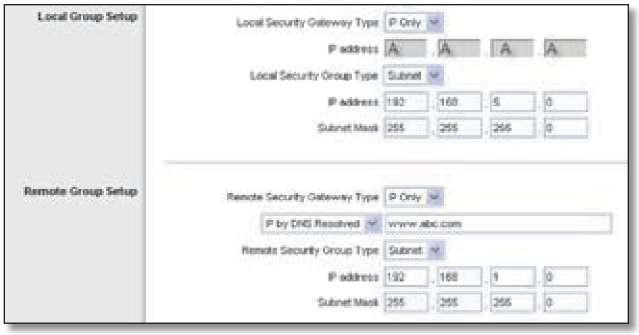
4. Click the **Gateway to Gateway** tab.

5. Enter a name in the *Tunnel Name* field.

6. For the VPN Tunnel setting, select **Enable**.

7. For the Local Security Gateway Type, select **IP Only**. The WAN IP address (A.A.A.A) of the RVL200 will be automatically detected.

   For the Local Security Group Type, select **Subnet**. Enter the RVL200's local network settings in the *IP Address* and *Subnet Mask* fields.

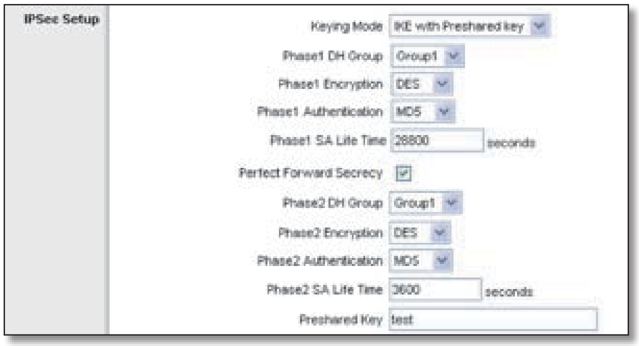


Local Group Setup
Local Security Gateway Type: IP Only
IP address: A . A . A . A
Local Security Group Type: Subnet
IP address: 192 . 168 . 5 . 0
Subnet Mask: 255 . 255 . 255 . 0

Remote Group Setup
Remote Security Gateway Type: IP Only
IP by DNS Resolved: www.abc.com
Remote Security Group Type: Subnet
IP address: 192 . 168 . 1 . 0
Subnet Mask: 255 . 255 . 255 . 0

RVL200 IPSec VPN Settings

8. For the Remote Security Gateway Type, select **IP Only**. Then select **IP by DNS Resolved**. Enter the RV042's domain name in the field provided.
9. For the Remote Security Group Type, select **Subnet**. Enter the RV042's local network settings in the *IP Address* and *Subnet Mask* fields.
10. In the IPSec Setup section, select the appropriate encryption, authentication, and other key management settings.
11. In the *Preshared Key* field, enter a string for this key, for example, 13572468.



IPSec Setup
Keying Mode: IKE with Preshared key
Phase1 DH Group: Group1
Phase1 Encryption: DES
Phase1 Authentication: MD5
Phase1 SA Life Time: 28800 seconds
Perfect Forward Secrecy: ☑
Phase2 DH Group: Group1
Phase2 Encryption: DES
Phase2 Authentication: MD5
Phase2 SA Life Time: 3600 seconds
Preshared Key: test

RVL200 IPSec Setup Settings

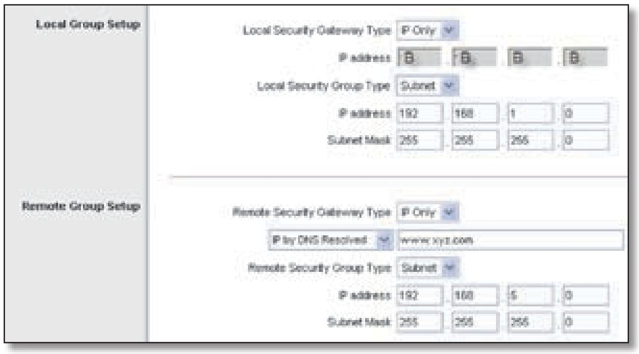
12. If you need more detailed settings, click **Advanced Settings**. Otherwise, click **Save Settings** and proceed to the next section, "Configuration of the RV042."

Configuration of the RV042

Follow similar instructions for the RV042.

1. Launch the web browser for a networked computer, designated PC 2.
2. Access the web-based utility of the RV042. (Refer to "Chapter 4: Advanced Configuration" for details.)
3. Click the **VPN** tab.
4. Click the **Gateway to Gateway** tab.
5. Enter a name in the *Tunnel Name* field.
6. Select the appropriate Interface, **WAN1** or **WAN2**.
7. Select **Enable**.
8. For the Local Security Gateway Type, select **IP Only**. The WAN IP address (B.B.B.B) of the RV042 will be automatically detected.

   For the Local Security Group Type, select **Subnet**. Enter the RV042's local network settings in the *IP Address* and *Subnet Mask* fields.

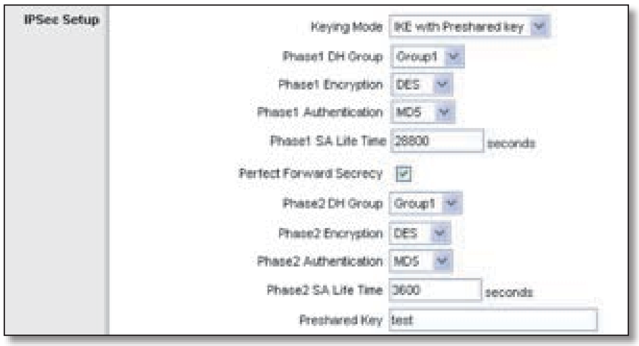


Local Group Setup
Local Security Gateway Type: IP Only
IP address: B . B . B . B
Local Security Group Type: Subnet
IP address: 192 . 168 . 1 . 0
Subnet Mask: 255 . 255 . 255 . 0

Remote Group Setup
Remote Security Gateway Type: IP Only
IP by DNS Resolved: www.xyz.com
Remote Security Group Type: Subnet
IP address: 192 . 168 . 5 . 0
Subnet Mask: 255 . 255 . 255 . 0

RV042 VPN Settings

9. For the Remote Security Gateway Type, select **IP Only**. Then select **IP by DNS Resolved**. Enter the RVL200's domain name in the field provided.
10. For the Remote Security Group Type, select **Subnet**. Enter the RVL200's local network settings in the *IP Address* and *Subnet Mask* fields.
11. In the IPSec Setup section, select the appropriate encryption, authentication, and other key management settings. (These should match the settings of the RVL200.)
12. In the *Preshared Key* field, enter a string for this key, for example, 13572468.



IPSec Setup
Keying Mode: IKE with Preshared key
Phase1 DH Group: Group1
Phase1 Encryption: DES
Phase1 Authentication: MD5
Phase1 SA Life Time: 28800 seconds
Perfect Forward Secrecy: ☑
Phase2 DH Group: Group1
Phase2 Encryption: DES
Phase2 Authentication: MD5
Phase2 SA Life Time: 3600 seconds
Preshared Key: test

RV042 IPSec Setup Settings

13. If you need more detailed settings, click **Advanced Settings**. Otherwise, click **Save Settings**.

Configuration of PC 1 and PC 2

Verify that PC 1 and PC 2 can ping each other (refer to Windows Help for more information). If they can ping each other, then the VPN tunnel is configured correctly.

Appendix D: IPSec NAT Traversal

Overview

Network Address Translation (NAT) traversal is a technique developed so that data protected by IPSec can pass through a NAT. (See NAT 1 and NAT 2 in the diagram.) Since IPSec provides integrity for the entire IP datagram, any changes to the IP addressing will invalidate the data. To resolve this issue, NAT traversal appends a new IP and UDP header to the incoming datagram, ensuring that no changes are made to the incoming datagram stream.

This chapter discusses two scenarios. In the first scenario, Router A initiates IKE negotiation, while in the second scenario, Router B initiates IKE negotiation. In the second scenario, since the IKE responder is behind a NAT device, a one-to-one NAT rule is required on the NAT device.

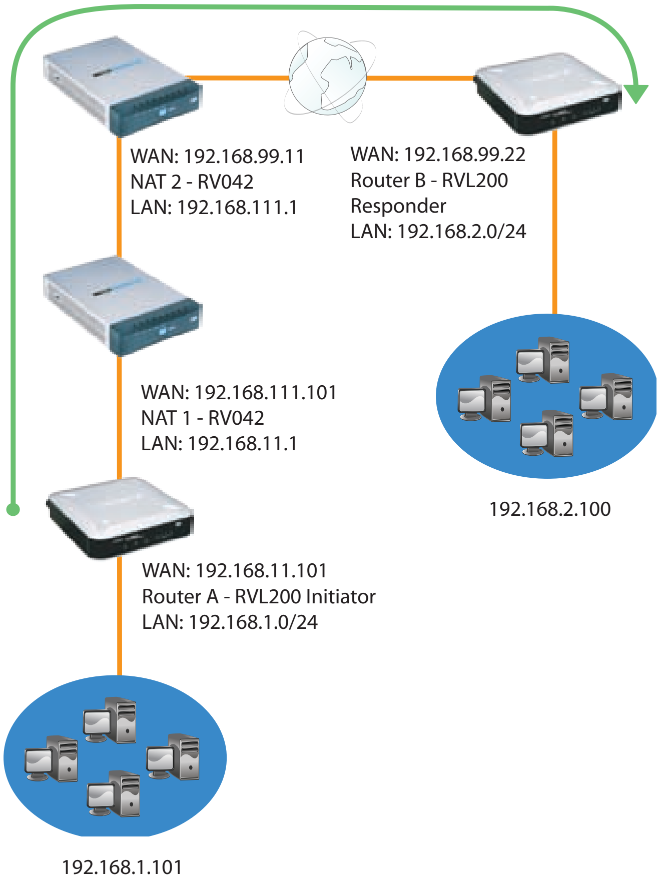
Before You Begin

The following is a list of equipment you need:

- Two 4-Port SSL/IPSec VPN Routers (model number: RVL200), one of which is connected to the Internet
- Two 10/100 4-Port VPN Routers (model number: RV042), one of which is connected to the Internet

Configuration of Scenario 1

In this scenario, Router A is the RVL200 Initiator, while Router B is the RVL200 Responder.



Traffic in Scenario 1

NOTE: Both the IPSec initiator and responder must support the mechanism for detecting the NAT router in the path and changing to a new port, as defined in RFC 3947.

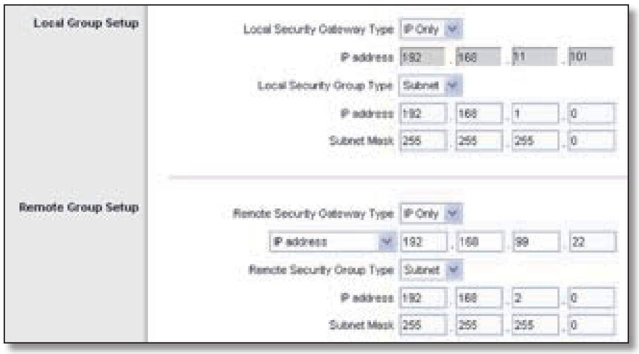
Configuration of Router A

Follow these instructions for Router A.

1. Launch the web browser for a networked computer, designated PC 1.
2. Access the web-based utility of Router A. (Refer to the User Guide of the RVL200 for details.)
3. Click the **IPSec VPN** tab.
4. Click the **Gateway to Gateway** tab.
5. Enter a name in the *Tunnel Name* field.
6. For the VPN Tunnel setting, select **Enable**.

7. For the Local Security Gateway Type, select **IP Only**. The WAN IP address of Router A will be automatically detected.

   For the Local Security Group Type, select **Subnet**. Enter Router A's local network settings in the *IP Address* and *Subnet Mask* fields.



Local Group Setup

Local Security Gateway Type: IP Only

IP address: 192 . 168 . 11 . 101

Local Security Group Type: Subnet

IP address: 192 . 168 . 1 . 0

Subnet Mask: 255 . 255 . 255 . 0

Remote Group Setup

Remote Security Gateway Type: IP Only

IP address: 192 . 168 . 99 . 22

Remote Security Group Type: Subnet

IP address: 192 . 168 . 2 . 0

Subnet Mask: 255 . 255 . 255 . 0

Router A's IPSec VPN Settings

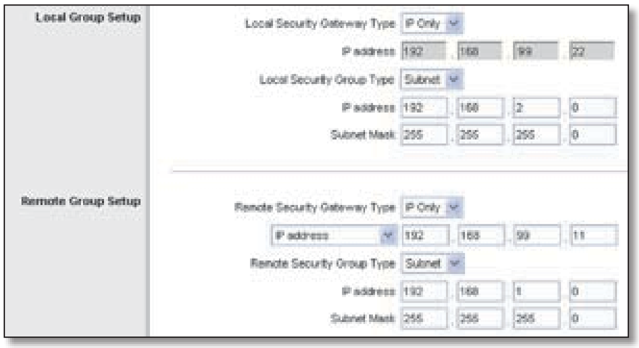
8. For the Remote Security Gateway Type, select **IP Only**. Enter Router B's WAN IP address in the *IP Address* field.
9. For the Remote Security Group Type, select **Subnet**. Enter Router B's local network settings in the *IP Address* and *Subnet Mask* fields.
10. In the IPSec Setup section, select the appropriate encryption, authentication, and other key management settings.
11. In the *Preshared Key* field, enter a string for this key, for example, 13572468.
12. If you need more detailed settings, click **Advanced Settings**. Otherwise, click **Save Settings** and proceed to the next section, "Configuration of Router B."

Configuration of Router B

Follow these instructions for Router B.

1. Launch the web browser for a networked computer, designated PC 2.
2. Access the web-based utility of Router B. (Refer to the User Guide of the RVL200 for details.)
3. Click the **IPSec VPN** tab.
4. Click the **Gateway to Gateway** tab.
5. Enter a name in the *Tunnel Name* field.
6. For the VPN Tunnel setting, select **Enable**.
7. For the Local Security Gateway Type, select **IP Only**. The WAN IP address of Router B will be automatically detected.

   For the Local Security Group Type, select **Subnet**. Enter Router B's local network settings in the *IP Address* and *Subnet Mask* fields.



Local Group Setup

Local Security Gateway Type: IP Only

IP address: 192 . 168 . 99 . 22

Local Security Group Type: Subnet

IP address: 192 . 168 . 2 . 0

Subnet Mask: 255 . 255 . 255 . 0

Remote Group Setup

Remote Security Gateway Type: IP Only

IP address: 192 . 168 . 99 . 11

Remote Security Group Type: Subnet

IP address: 192 . 168 . 1 . 0

Subnet Mask: 255 . 255 . 255 . 0

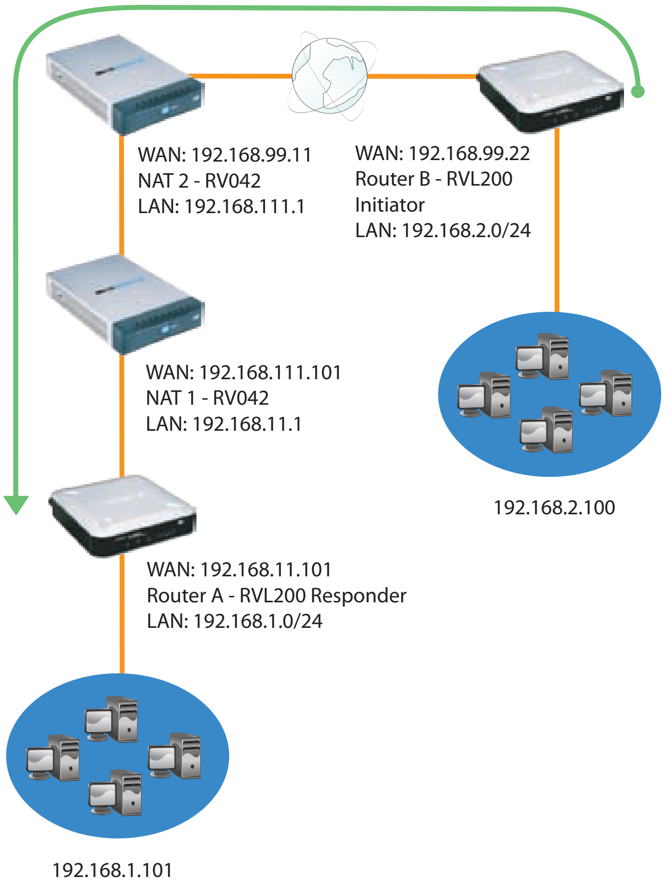
Router B's IPSec VPN Settings

8. For the Remote Security Gateway Type, select **IP Only**. Enter the WAN IP address of NAT 2 - RV042 in the *IP Address* field.
9. For the Remote Security Group Type, select **Subnet**. Enter Router A's local network settings in the *IP Address* and *Subnet Mask* fields.
10. In the IPSec Setup section, select the appropriate encryption, authentication, and other key management settings.
11. In the *Preshared Key* field, enter a string for this key, for example, 13572468.
12. If you need more detailed settings, click **Advanced Settings**. Otherwise, click **Save Settings**.

Configuration of Scenario 2

In this scenario, Router B is the RVL200 Initiator, while Router A is the RVL200 Responder. Router B will have the Remote Security Gateway IP address set to a public IP address that is associated with the WAN IP address of Router A, which is behind the NAT. Hence the public IP address (192.168.99.1) must be mapped to the WAN IP address (192.168.11.101, a private IP address) of Router A through the two one-to-one NAT rules:

- 192.168.99.1 => 192.168.111.11 (on NAT 2)
- 192.168.111.11 => 192.168.11.101 (on NAT 1)



Traffic in Scenario 2

NOTE: Both the IPSec initiator and responder must support the mechanism for detecting the NAT router in the path and changing to a new port, as defined in RFC 3947.

Configuration of the One-to-One NAT Rules

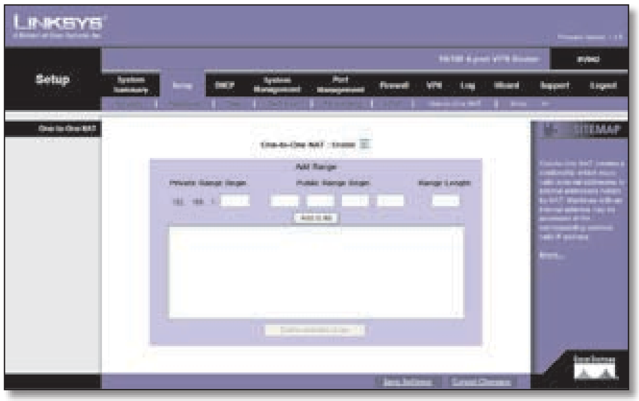
The one-to-one NAT rules must be configured on NAT 2 - RV042 and NAT 1 - RVO42.

One-to-One NAT Rule on NAT 2 - RV042

192.168.99.1 => 192.168.111.11

Follow these instructions for the one-to-one NAT rule on NAT 2 - RV042.

1. Launch the web browser for a networked computer.
2. Access the web-based utility of NAT 2 - RV042. (Refer to "Chapter 4: Advanced Configuration" for details.)
3. Click the **Setup** tab.
4. Click the **One-to-One NAT** tab.
5. For the One-to-One NAT setting, select **Enable**.



Setup > One-to-One NAT

6. In the *Private Range Begin* field, enter **99.1**.
7. In the *Public Range Begin* field, enter **111.11**.
8. In the *Range Length* field, enter an appropriate value. The range length cannot exceed the number of valid IP addresses. To map a single address, enter **1**.
9. Click **Add to List**.
10. Click **Save Settings**.

Refer to "Chapter 4: Advanced Configuration" for more details about one-to-one NAT rules.

One-to-One NAT Rule on NAT 1 - RV042

192.168.111.11 => 192.168.11.101

Follow these instructions for the one-to-one NAT rule on NAT 1 - RV042.

1. Launch the web browser for a networked computer.
2. Access the web-based utility of NAT 1 - RV042. (Refer to "Chapter 4: Advanced Configuration" for details.)
3. Click the **Setup** tab.

4. Click the **One-to-One NAT** tab.

5. For the One-to-One NAT setting, select **Enable**.

6. In the *Private Range Begin* field, enter **111.11**.

7. In the *Public Range Begin* field, enter **11.101**.

8. In the *Range Length* field, enter an appropriate value. The range length cannot exceed the number of valid IP addresses. To map a single address, enter **1**.

9. Click **Add to List**.

10. Click **Save Settings**.

Refer to "Chapter 4: Advanced Configuration" for more details about one-to-one NAT rules.

Configuration of Router B

Set the Remote Security Gateway to IP address: **192.168.99.1**, which is the one-to-one NAT IP address used by NAT 2 - RV042.

Follow these instructions for Router B.

1. Launch the web browser for a networked computer, designated PC 2.

2. Access the web-based utility of Router B. (Refer to the User Guide of the RVL200 for details.)

3. Click the **IPSec VPN** tab.

4. Click the **Gateway to Gateway** tab.

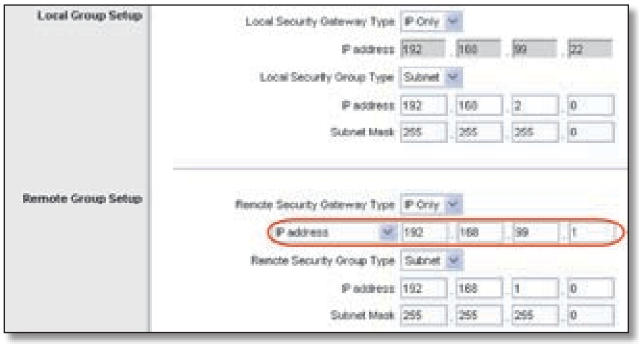
5. Enter a name in the *Tunnel Name* field.

6. For the VPN Tunnel setting, select **Enable**.

7. For the Local Security Gateway Type, select **IP Only**. The WAN IP address of Router B will be automatically detected.

   For the Local Security Group Type, select **Subnet**. Enter Router B's local network settings in the *IP Address* and *Subnet Mask* fields.

8. For the Remote Security Gateway Type, select **IP Only**. Enter **192.168.99.1** in the *IP Address* field.



Local Group Setup

Local Security Gateway Type: IP Only

IP address: 192 . 168 . 99 . 22

Local Security Group Type: Subnet

IP address: 192 . 168 . 2 . 0

Subnet Mask: 255 . 255 . 255 . 0

Remote Group Setup

Remote Security Gateway Type: IP Only

IP address: 192 . 168 . 99 . 1

Remote Security Group Type: Subnet

IP address: 192 . 168 . 1 . 0

Subnet Mask: 255 . 255 . 255 . 0

Router B's IPSec VPN Settings

9. For the Remote Security Group Type, select **Subnet**. Enter Router A's local network settings in the *IP Address* and *Subnet Mask* fields.

10. In the IPSec Setup section, select the appropriate encryption, authentication, and other key management settings.

11. In the *Preshared Key* field, enter a string for this key, for example, 13572468.

12. If you need more detailed settings, click **Advanced Settings**. Otherwise, click **Save Settings** and proceed to the next section, "Configuration of Router A."

Configuration of Router A

Follow these instructions for Router A.

1. Launch the web browser for a networked computer, designated PC 1.

2. Access the web-based utility of Router A. (Refer to the User Guide of the RVL200 for details.)

3. Click the **IPSec VPN** tab.

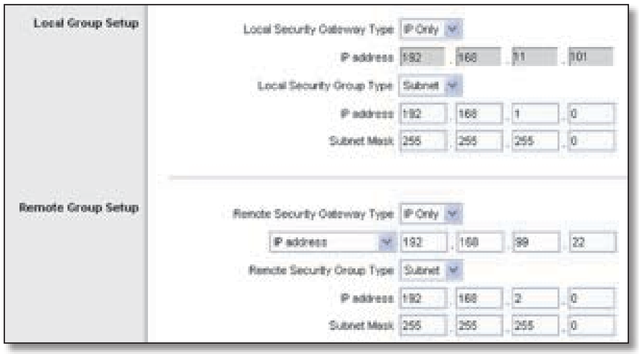
4. Click the **Gateway to Gateway** tab.

5. Enter a name in the *Tunnel Name* field.

6. For the VPN Tunnel setting, select **Enable**.

7. For the Local Security Gateway Type, select **IP Only**. The WAN IP address of Router A will be automatically detected.

   For the Local Security Group Type, select **Subnet**. Enter Router A's local network settings in the *IP Address* and *Subnet Mask* fields.



Local Group Setup

Local Security Gateway Type: IP Only

IP address: 192 . 168 . 11 . 101

Local Security Group Type: Subnet

IP address: 192 . 168 . 1 . 0

Subnet Mask: 255 . 255 . 255 . 0

Remote Group Setup

Remote Security Gateway Type: IP Only

IP address: 192 . 168 . 99 . 22

Remote Security Group Type: Subnet

IP address: 192 . 168 . 2 . 0

Subnet Mask: 255 . 255 . 255 . 0

Router A's IPSec VPN Settings

NOTE: This configuration is the same as the configuration of Router A in scenario 1.

8. For the Remote Security Gateway Type, select **IP Only**. Enter Router B's WAN IP address in the *IP Address* field.

9. For the Remote Security Group Type, select **Subnet**. Enter Router B's local network settings in the *IP Address* and *Subnet Mask* fields.
10. In the IPSec Setup section, select the appropriate encryption, authentication, and other key management settings.
11. In the *Preshared Key* field, enter a string for this key, for example, 13572468.
12. If you need more detailed settings, click **Advanced Settings**. Otherwise, click **Save Settings**.

Appendix E: Bandwidth Management

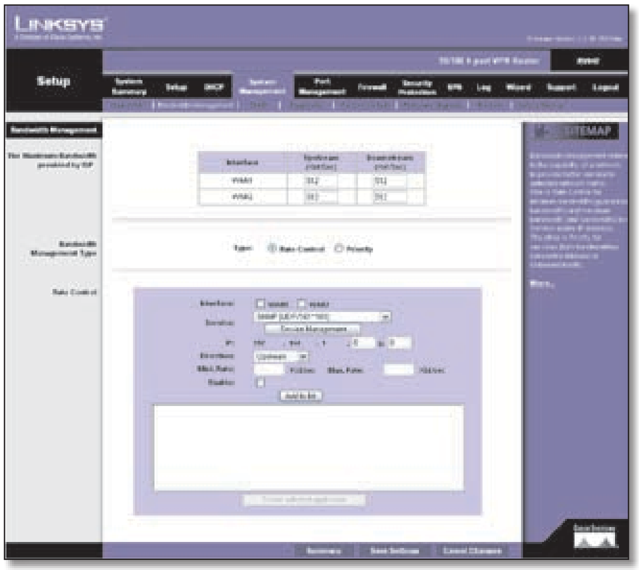
Overview

This appendix explains how to ensure Quality of Service (QoS) on Vonage Voice over Internet Protocol (VoIP) phone service. This example uses Vonage; however, similar instructions will apply to other VoIP services.

Creation of New Services

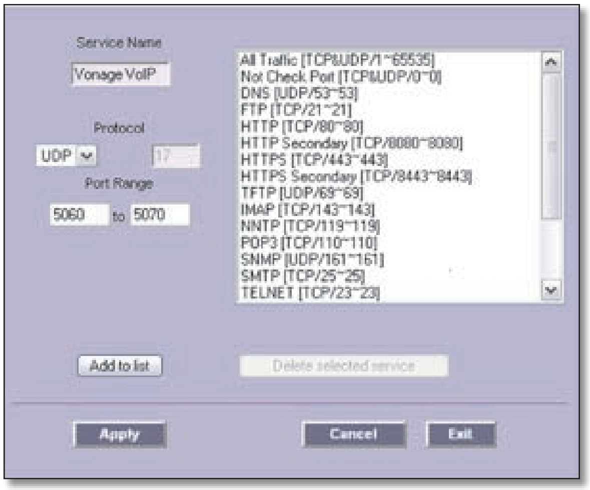
Create two new services, Vonage VoIP and Vonage 2.

1. Visit Vonage’s website at http://www.vonage.com. Find out the ports used for Vonage VoIP service.
2. Access the Router’s web-based utility. (Refer to “Chapter 4: Advanced Configuration” for details.)
3. Click the **QoS** tab.
4. On the *Bandwidth Management* screen, click **Service Management**.



QoS > Bandwidth Management

5. On the *Service Management* screen, enter a name, such as Vonage VoIP, in the *Service Name* field.

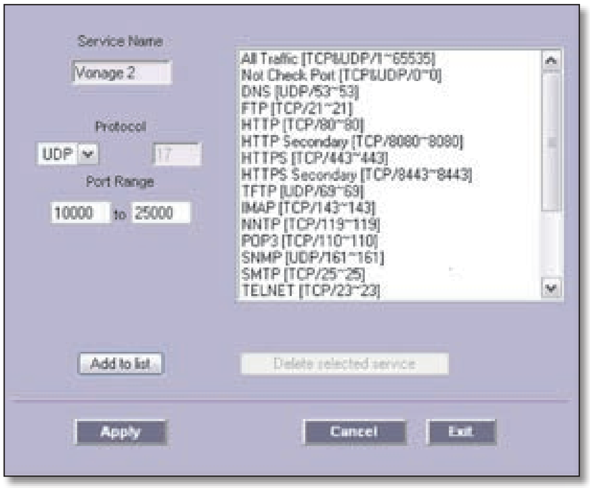


Service Name: Vonage VoIP
Protocol: UDP 17
Port Range: 5060 to 5070

All Traffic [TCP&UDP/1~65535]
Not Check Port [TCP&UDP/0~0]
DNS [UDP/53~53]
FTP [TCP/21~21]
HTTP [TCP/80~80]
HTTP Secondary [TCP/8080~8080]
HTTPS [TCP/443~443]
HTTPS Secondary [TCP/8443~8443]
TFTP [UDP/69~69]
IMAP [TCP/143~143]
NNTP [TCP/119~119]
POP3 [TCP/110~110]
SNMP [UDP/161~161]
SMTP [TCP/25~25]
TELNET [TCP/23~23]

Add Vonage VoIP Service

6. From the *Protocol* drop-down menu, select the protocol the VoIP service uses. For example, some VoIP devices use UDP.
7. Enter its SIP port range in the *Port Range* fields. For example, you can set the Port Range to 5060 to 5070 to make sure that all active ports are covered.
8. Click **Add to List**.
9. Add a second service. Enter a name, such as Vonage 2, in the *Service Name* field.



Service Name: Vonage 2
Protocol: UDP 17
Port Range: 10000 to 25000

All Traffic [TCP&UDP/1~65535]
Not Check Port [TCP&UDP/0~0]
DNS [UDP/53~53]
FTP [TCP/21~21]
HTTP [TCP/80~80]
HTTP Secondary [TCP/8080~8080]
HTTPS [TCP/443~443]
HTTPS Secondary [TCP/8443~8443]
TFTP [UDP/69~69]
IMAP [TCP/143~143]
NNTP [TCP/119~119]
POP3 [TCP/110~110]
SNMP [UDP/161~161]
SMTP [TCP/25~25]
TELNET [TCP/23~23]

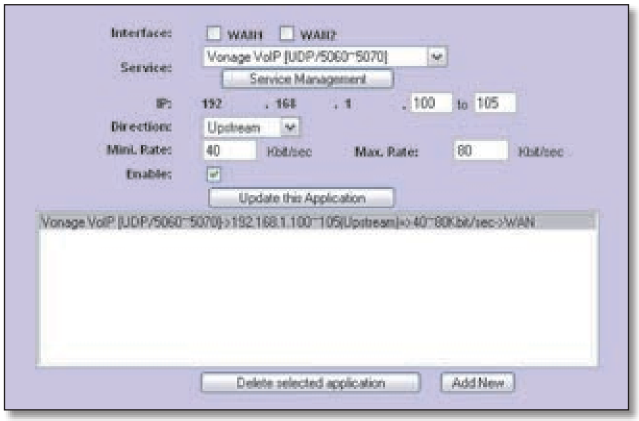
Add Vonage 2 Service

10. From the *Protocol* drop-down menu, select **UDP**.
11. Enter the RTP port range in the *Port Range* fields. These are required for both incoming and outgoing traffic. For example, you can set the Port Range to 10000 to 25000 to make sure that all active ports are covered.
12. Click **Add to List**.
13. Click **Apply** to save your changes.

Creation of New Bandwidth Management Rules

Create four new rules: Vonage VoIP (Upstream), Vonage VoIP (Downstream), Vonage 2 (Upstream), and Vonage 2 (Downstream).

1. On the *Bandwidth Management* screen, select **Vonage VoIP** from the *Service* drop-down menu.
2. Enter the IP address or range you need to control. To include all internal IP addresses, keep the default, **0**.
3. From the *Direction* drop-down menu, select **Upstream** for outbound traffic.
4. In the *Min. Rate* field, enter the minimum rate for the guaranteed bandwidth. For example, you can set a minimum rate of 40 kbit/sec.
5. In the *Max. Rate* field, enter the maximum rate for the maximum bandwidth. For example, you can set a maximum rate of 80 kbit/sec.
6. Select **Enable** to enable this rule.
7. After you have set up the rule, click **Add to list**.



Interface: □ WAN1 □ WAN2

Service: Vonage VoIP [UDP/5060~5070]

IP: 192 . 168 . 1 . 100 to 105

Direction: Upstream

Mini. Rate: 40 Kbit/sec Max. Rate: 80 Kbit/sec

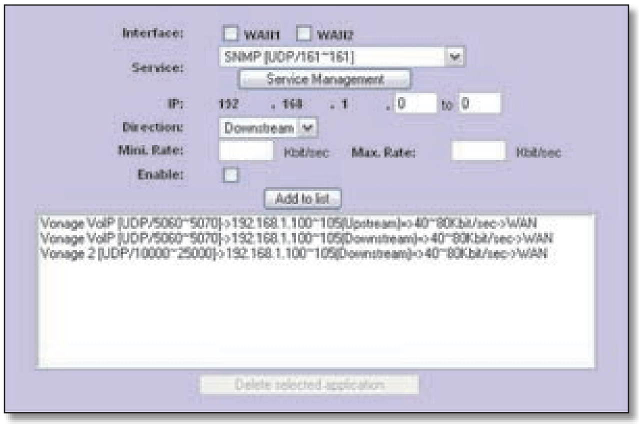
Enable: ☑

Vonage VoIP [UDP/5060~5070]->192.168.1.100~105(Upstream)=>40~80Kbit/sec->WAN

Create Vonage VoIP Rule

8. Set up a second rule for Vonage VoIP, this time for the Downstream direction.

   Select **Vonage VoIP** from the *Service* drop-down menu.
9. Enter the IP address or range you need to control. To include all internal IP addresses, keep the default, **0**.
10. From the *Direction* drop-down menu, select **Downstream** for inbound traffic.
11. In the *Min. Rate* field, enter the minimum rate for the guaranteed bandwidth. For example, you can set a minimum rate of 40 kbit/sec.
12. In the *Max. Rate* field, enter the maximum rate for the maximum bandwidth. For example, you can set a maximum rate of 80 kbit/sec.
13. Select **Enable** to enable this rule.
14. After you have set up the rule, click **Add to list**.
15. Set up a rule for Vonage 2. Select **Vonage 2** from the *Service* drop-down menu.
16. Enter the IP address or range you need to control. To include all internal IP addresses, keep the default, **0**.
17. From the *Direction* drop-down menu, select **Upstream** for outbound traffic.
18. In the *Min. Rate* field, enter the minimum rate for the guaranteed bandwidth. For example, you can set a minimum rate of 40 kbit/sec.
19. In the *Max. Rate* field, enter the maximum rate for the maximum bandwidth. For example, you can set a maximum rate of 80 kbit/sec.
20. Select **Enable** to enable this rule.
21. After you have set up the rule, click **Add to list**.
22. Set up a second rule for Vonage 2 (Downstream). Select **Vonage 2** from the *Service* drop-down menu.
23. Enter the IP address or range you need to control. To include all internal IP addresses, keep the default, **0**.
24. From the *Direction* drop-down menu, select **Downstream** for inbound traffic.
25. In the *Min. Rate* field, enter the minimum rate for the guaranteed bandwidth. For example, you can set a minimum rate of 40 kbit/sec.
26. In the *Max. Rate* field, enter the maximum rate for the maximum bandwidth. For example, you can set a maximum rate of 80 kbit/sec.
27. Select **Enable** to enable this rule.
28. After you have set up the rule, click **Add to list**.



Interface: □ WAN1 □ WAN2

Service: SNMP [UDP/161~161]

IP: 192 . 168 . 1 . 0 to 0

Direction: Downstream

Mini. Rate: Kbit/sec Max. Rate: Kbit/sec

Enable: □

Vonage VoIP [UDP/5060~5070]->192.168.1.100~105(Upstream)=>40~80Kbit/sec->WAN
Vonage VoIP [UDP/5060~5070]->192.168.1.100~105(Downstream)=>40~80Kbit/sec->WAN
Vonage 2 [UDP/10000~25000]->192.168.1.100~105(Downstream)=>40~80Kbit/sec->WAN

Create Vonage 2 Rule

29. Click **Save Settings**.

Appendix F: Firmware Upgrade

Overview

This appendix explains how to upgrade the firmware of the Router.

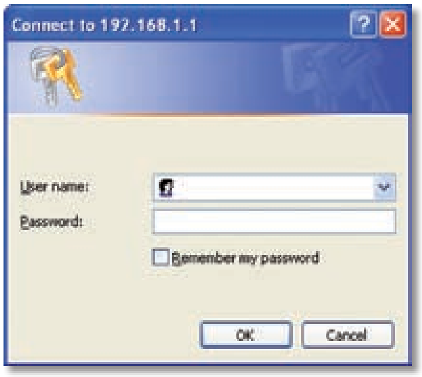
How to Access the Web-Based Utility

1. For local access of the Router's web-based utility, launch your web browser, and enter the Router's default IP address, **192.168.1.1**, in the *Address* field. Press the **Enter** key.

Address Bar

> **NOTE:** If the Remote Management feature on the *Firewall* > *General* screen has been enabled, then users with administrative privileges can remotely access the web-based utility. Use **http://<WAN IP address of the Router>**, or use **https://<WAN IP address of the Router>** if you have enabled the HTTPS feature.

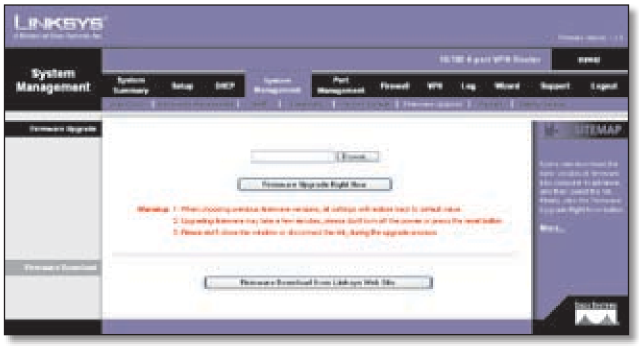
2. A login screen prompts you for your User name and Password. Enter **admin** in the *User name* field, and enter **admin** in the *Password* field. (You can change the Password on the *Setup* > *Password* screen.) Then click **OK**.



Login Screen

Upgrade the Firmware

1. In the Router's web-based utility, click the **System Management** tab.
2. Click the **Firmware Upgrade** tab.
3. In the Firmware Download section, click **Firmware Download from Linksys Web Site**.



System Management > Firmware Upgrade

4. The Support page of the Linksys website appears. Follow the on-screen instructions to access the Downloads page for the 10/100 4-Port VPN Router (model number: RV042).
5. Download the firmware upgrade file.
6. Extract the file on your computer.
7. In the Firmware Upgrade section of the *Firmware Upgrade* screen, click the **Browse** button to locate the extracted file.
8. After you have selected the extracted file, click **Firmware Upgrade Right Now**.

> **NOTE:** The Router will take approximately ten minutes to upgrade its firmware. During this process, do not power off the Router or press the Reset button.

Alternative Firmware Upgrade Option

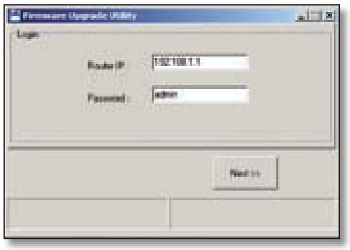
If the web-based upgrade method fails, use the TFTP utility. Follow these instructions:

1. Use a computer on the local network of the Router. Set the computer to a static IP address. (For example, if the Router uses 192.168.1.1, then set the computer to **192.168.1.100**.)
2. Go to **www.linksys.com/downloads**.
3. Select your region, and then select your country.
4. In the *Enter Model Number* field, enter **RV042**. Then click **Go**.
5. In the *Please select version* drop-down menu, select the version number of the RV042. (For more information about how to find the version number, click the image of the RV042's bottom panel with the sticker displayed.)
6. In the Firmware section, click **TFTP Utility**.

7. The utility zip file will automatically open. Extract .exe file to an appropriate location on your computer.

8. Double-click the **.exe** file.

9. In the *Router IP* field, enter the IP address of the Router.



Router IP: 192.168.1.1

Password: admin

Firmware Upgrade Utility Login

10. In the *Password* field, enter the password for access to the Router.

11. Click **Next**, and then follow the on-screen instructions.

Appendix G: Trend Micro ProtectLink Gateway Service

Overview

The optional Trend Micro ProtectLink Gateway service provides security for your network. It checks e-mail messages, filters website addresses (URLs), and blocks potentially malicious websites. (To purchase a license for this service, contact your Linksys reseller.)

This appendix explains how to use this service.

How to Access the Web-Based Utility

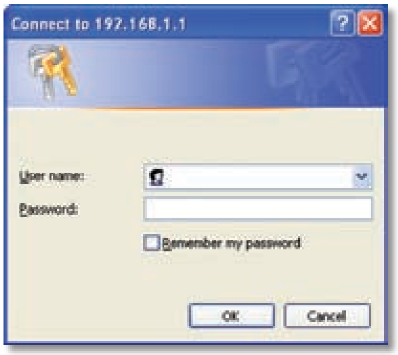
1. For local access of the Router's web-based utility, launch your web browser, and enter the Router's default IP address, **192.168.1.1**, in the *Address* field. Press the **Enter** key.

Address http://192.168.1.1

Address Bar

NOTE: If the Remote Management feature on the *Firewall* > *General* screen has been enabled, then users with administrative privileges can remotely access the web-based utility. Use **http://<WAN IP address of the Router>**, or use **https://<WAN IP address of the Router>** if you have enabled the HTTPS feature.

2. A login screen prompts you for your User name and Password. Enter **admin** in the *User name* field, and enter **admin** in the *Password* field. (You can change the Password on the *Setup* > *Password* screen.) Then click **OK**.



Connect to 192.168.1.1

User name:

Password:

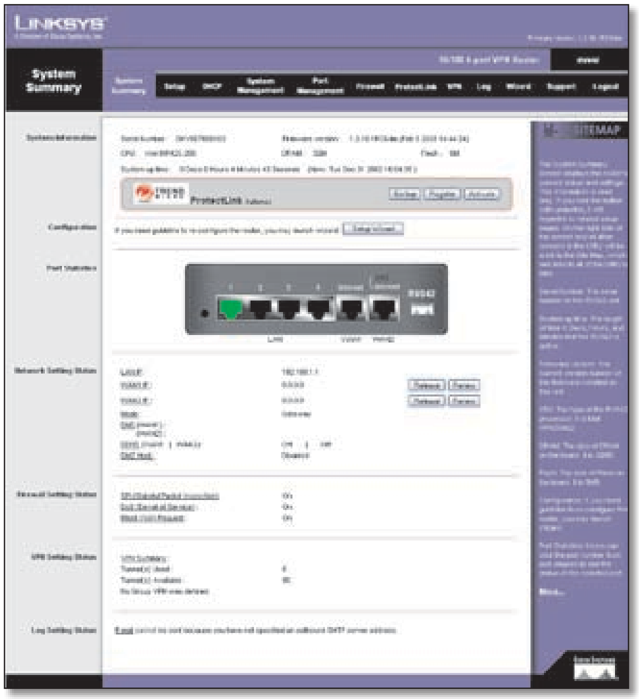
□ Remember my password

Login Screen

How to Purchase, Register, or Activate the Service

You can purchase, register, or activate the service using the *System Summary* or *ProtectLink* screen.

System Summary



System Summary (ProtectLink Available)

Follow the instructions for the appropriate option:

- Go buy
- Register
- Activate

Trend Micro ProtectLink Gateway

NOTE: If the Trend Micro ProtectLink Gateway options are not displayed on the *System Summary* screen, upgrade the Router's firmware. Refer to "Appendix F: Firmware Upgrade" for instructions.

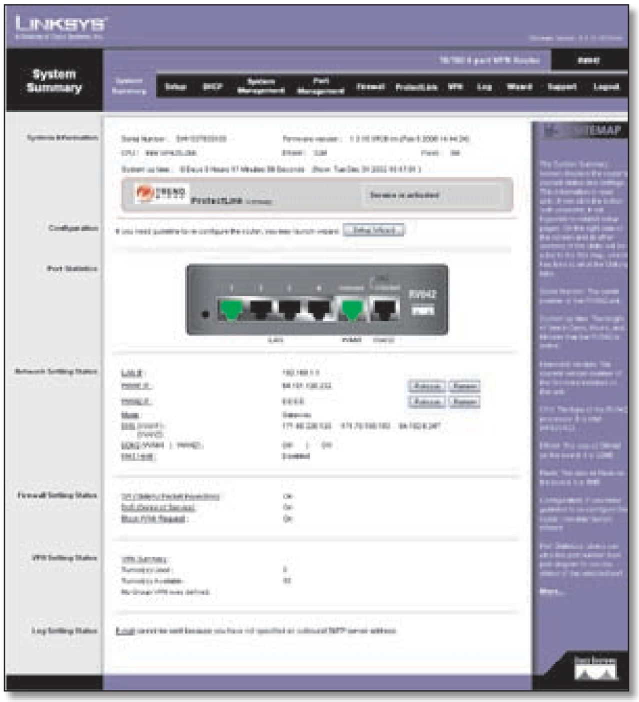
Go buy To purchase a license to use this service, click **Go buy**. You will be redirected to a list of Linksys resellers on the Linksys website. Then follow the on-screen instructions.

Register If you already have a license, click **Register**. You will be redirected to the Trend Micro ProtectLink Gateway website. Then follow the on-screen instructions.

NOTE: To have your e-mail checked, you will need to provide the domain name and IP address of your e-mail server. If you do not know this information, contact your ISP.

Activate If you have registered, click **Activate**. A wizard begins. Follow the on-screen instructions.

When the wizard is complete, the *System Summary* screen will indicate that the service has been activated.

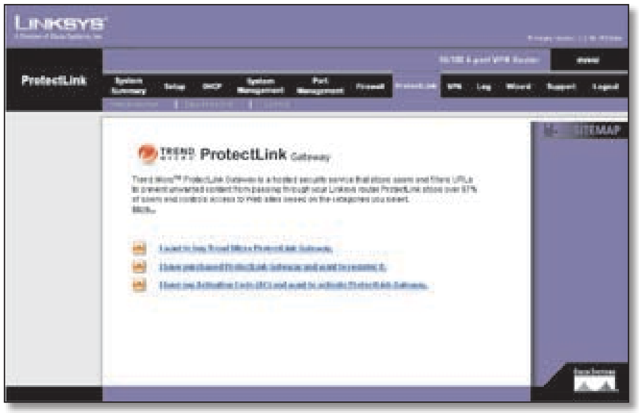


System Summary (ProtectLink Activated)

ProtectLink

Click the **ProtectLink** tab to display this screen.

NOTE: If the ProtectLink tab is not displayed, upgrade the Router's firmware. Refer to "Appendix F: Firmware Upgrade" for instructions.



ProtectLink

Follow the instructions for the appropriate option:

- I want to buy Trend Micro ProtectLink.
- I want to register online.
- I want to activate Trend Micro ProtectLink.

I want to buy Trend Micro ProtectLink Gateway. To purchase a license to use this service, click this link. You will be redirected to a list of Linksys resellers on the Linksys website. Then follow the on-screen instructions.

I have purchased ProtectLink Gateway and want to register it. If you already have a license, click this link. You will be redirected to the Trend Micro ProtectLink Gateway website. Then follow the on-screen instructions.

NOTE: To have your e-mail checked, you will need to provide the domain name and IP address of your e-mail server. If you do not know this information, contact your ISP.

I have my Activation Code (AC) and want to activate ProtectLink Gateway. If you have registered, click this link. A wizard begins. Follow the on-screen instructions.

When the wizard is complete, the Web Protection, Email Protection, and License tabs will appear.

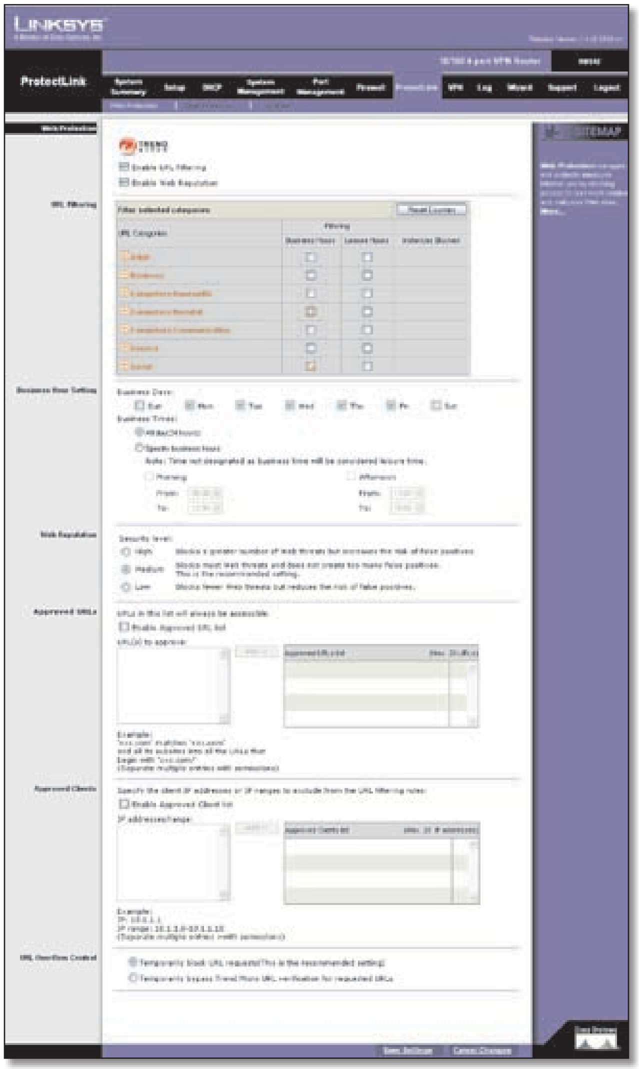
NOTE: If you replace the Router with a new router that supports this service, click **I have my Activation Code (AC) and want to activate ProtectLink Gateway**. Then use your current activation code to transfer your license for the ProtectLink service to the new router.

How to Use the Service

Configure the service to protect your network.

ProtectLink > Web Protection

The Web Protection features are provided by the Router. Configure the website filtering settings on this screen.



ProtectLink > Web Protection

Web Protection

Enable URL Filtering To filter website addresses (URLs), select this option.

Enable Web Reputation To block potentially malicious websites, select this option.

URL Filtering

Reset Counter The Router counts the number of attempted visits to a restricted URL. To reset the counter to zero, click **Reset Counter**.

For each URL category, select the appropriate Filtering option. If you want to filter a sub-category, click **+** to view the sub-categories for each category. Then select the appropriate Filtering option:

Business Hours To filter this URL category during the business hours you have specified, select this option.

Leisure Hours To filter this URL category during non-business hours, select this option.

Instances Blocked The number of attempted visits is displayed.

Business Hour Setting

Business Days Select the appropriate days. The default days are **Mon.** through **Fri.**

Business Times To specify entire days, keep the default, **All day (24 hours)**. To specify hours, select **Specify business hours**. For morning hours, select **Morning**, and then select the appropriate *From* and *To* times. For afternoon hours, select **Afternoon**, and then select the appropriate *From* and *To* times.

Web Reputation

Select the appropriate security level:

High This level blocks a higher number of potentially malicious websites but also increases the risk of false positives. (A false positive is a website that can be trusted but seems potentially malicious.)

Medium This level blocks most potentially malicious websites and does not create too many false positives. The default is **Medium** and is the recommended setting.

Low This level blocks fewer potentially malicious websites and reduces the risk of false positives.

Approved URLs

You can designate up to 20 trusted URLs that will always be accessible.

Enable Approved URL list To set up a list of always accessible URLs, select this option.

URL(s) to approve Enter the trusted URL(s). Separate multiple URLs with semicolons (“**;**”).

Add To add the URLs, click **Add**.

Approved URLs list The trusted URLs are displayed. To delete a URL, click its **trash can** icon.

Approved Clients

You can designate up to 20 trusted clients (local IP addresses) that will always have access to filtered URLs.

Enable Approved Client list To set up a list of trusted clients, select this option.

IP addresses/range Enter the appropriate IP addresses or ranges. Separate multiple URLs with semicolons (“**;**”). For a range of IP addresses, use a hyphen (“**-**”). Example: 10.1.1.0-10.1.1.10.

Add To add the IP addresses or ranges, click **Add**.

Approved Clients list The IP addresses or range of trusted clients are displayed. To delete an IP address or range, click its **trash can** icon.

URL Overflow Control

Specify the behavior you want if there are more URL requests than the service can handle.

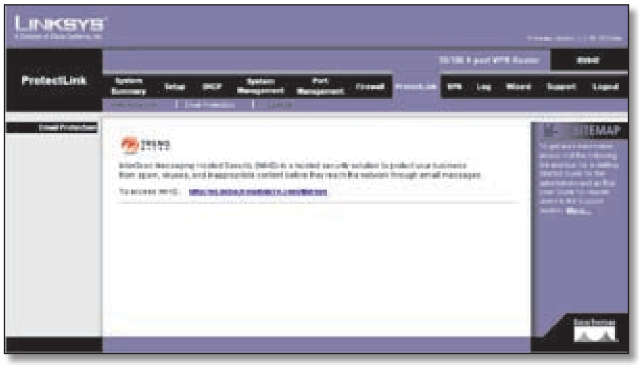
Temporarily block URL requests (This is the recommended setting) If there are too many URL requests, the overflow will be held back until they can be processed. This is the default setting.

Temporarily bypass Trend Micro URL verification for requested URLs If there are too many URL requests, the overflow will be allowed without verification.

Click **Save Settings** to save your changes, or click **Cancel Changes** to undo them.

ProtectLink > Email Protection

The Email Protection features are provided by an online service called IMHS, which stands for InterScan™ Messaging Hosted Security. It checks your e-mail messages so spam, viruses, and inappropriate content are filtered out. After you have configured the IMHS settings, your e-mail messages will be checked online before appropriate messages are forwarded to your network.



ProtectLink > Email Protection

Email Protection

NOTE: To have your e-mail checked, you will need to provide the domain name and IP address of your e-mail server. If you do not know this information, contact your ISP.

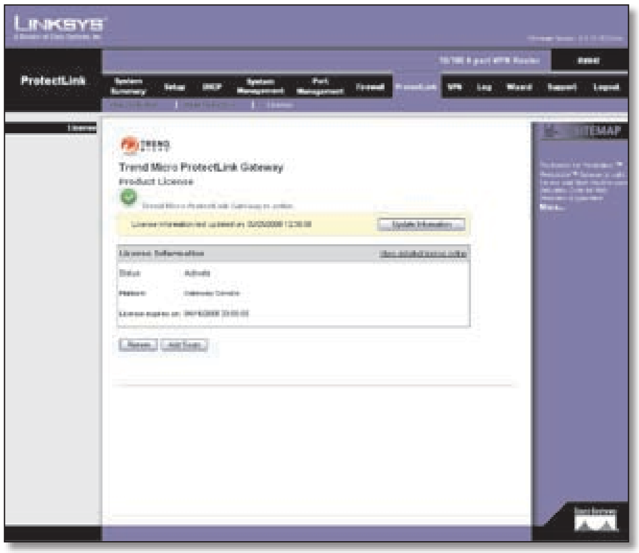
https://us.imhs.trendmicro.com/linksys To set up e-mail protection, click this link. You will be redirected to the Trend Micro ProtectLink Gateway website. Then follow the on-screen instructions.

ProtectLink > License

The license for the Trend Micro ProtectLink Gateway service (Email Protection and Web Protection) is valid for one year from the time the activation code for Web Protection is generated. If you do not provide the necessary information to activate Email Protection during registration, please provide that information as soon as possible because Email Protection and Web Protection will expire at the same time.

NOTE: For example, if you provide the information needed for Email Protection one month after receiving the activation code for Web Protection, then you will receive only 11 months of Email Protection.

On the *License* screen, license information is displayed. Use this screen to renew your license, add seats, or view license information online.



ProtectLink > License

License

Update Information To refresh the license information displayed on-screen, click **Update Information**.

License Information

View detailed license online To view license information online, click this link.

Status The status of your license, Activated or Expired, is displayed.

Platform The platform type, Gateway Service, is automatically displayed.

License expires on The date and time your license expires are displayed.

Renew To renew your license, click **Renew**. Then follow the on-screen instructions.

Add Seats Each seat allows an e-mail account to use Email Protection. To add seats to your license, click **Add Seats**. Then follow the on-screen instructions.

Appendix H: Specifications

Specifications

Model	RV042
Standards	IEEE 802.3, 802.3u
Ports	4 10/100 RJ-45 Ports, 1 10/100 RJ-45 Internet Port, 1 10/100 RJ-45 DMZ/Internet Port
Button	Reset
Cabling Type	Category 5 Ethernet
LEDs	System, Internet, DMZ/Internet, DMZ Mode, Diag, 1-4
UPnP able/cert	Cert
Operating System	Linux

Performance

NAT Throughput	100 Mbps
IPSec Throughput	59 Mbps

Security

Firewall	SPI Firewall
Access Rules	Up to 50 Entries
Port Forwarding	Up to 30 Entries
Port Triggering	Up to 30 Entries
URL Filtering	Static List by Domain or Keywords (included), Dynamic Filtering through Linksys/Trend Micro ProtectLink Gateway Services (optional)

Network

Dual WANs	Can be Configured for Smartlink Backup or Load Balance
Protocol Binding	Protocols can be Bound to Particular WAN Port under Load Balancing
DHCP	DHCP Server, DHCP Client
DNS	DNS Proxy, Dynamic DNS (DynDNS, 3322, PeanutHull)
NAT	Many-to-One, One-to-One
DMZ	DMZ Port, DMZ Host
Routing	Static and RIP v1, v2

QoS

Port-based QoS	Configurable per LAN Port
Service based QoS	Supports Rate Control or Priority
Rate Control	Upstream/Downstream Bandwidth can be Configured per Service
Priority	Each Service can be Mapped to One of the 3 Priority Levels

VPN

IPSec	50 IPSec Tunnels for Branch Office Connectivity
QuickVPN	50 QuickVPN Users for Remote Client Access
PPTP	Built-in PPTP Server Supporting 5 PPTP Clients
Encryption	DES, 3DES, AES-128, AES-192, AES-256
Authentication	MD5, SHA1
IPSec NAT-T	Supported for Gateway-to-Gateway and Client-to-Gateway Tunnels
VPN Passthrough	PPTP, L2TP, IPSec

Management

Web-Based	HTTPS
SNMP	Supports SNMP v1 and v2c
Log	Syslog, Email Alert

Environmental

Dimensions W x H x D	5.12" x 1.52" x 7.87" (130 x 38.5 x 200 mm)
Unit Weight	1.27 lb (0.576 kg)
Power	12V, 1A
Certifications	FCC Class B, CE Class B
Operating Temp.	0 to 40ºC (32 to 104ºF)
Storage Temp.	0 to 70ºC (32 to 158ºF)
Operating Humidity	10 to 85% Noncondensing
Storage Humidity	5 to 90% Noncondensing

Specifications are subject to change without notice.

Appendix I: Warranty Information

Linksys warrants this Linksys hardware product against defects in materials and workmanship under normal use for the Warranty Period, which begins on the date of purchase by the original end-user purchaser and lasts for the period specified for this product at **www.linksys.com/warranty**. The internet URL address and the web pages referred to herein may be updated by Linksys from time to time; the version in effect at the date of purchase shall apply.

This limited warranty is non-transferable and extends only to the original end-user purchaser. Your exclusive remedy and Linksys' entire liability under this limited warranty will be for Linksys, at its option, to (a) repair the product with new or refurbished parts, (b) replace the product with a reasonably available equivalent new or refurbished Linksys product, or (c) refund the purchase price of the product less any rebates. Any repaired or replacement products will be warranted for the remainder of the original Warranty Period or thirty (30) days, whichever is longer. All products and parts that are replaced become the property of Linksys.

Exclusions and Limitations

This limited warranty does not apply if: (a) the product assembly seal has been removed or damaged, (b) the product has been altered or modified, except by Linksys, (c) the product damage was caused by use with non-Linksys products, (d) the product has not been installed, operated, repaired, or maintained in accordance with instructions supplied by Linksys, (e) the product has been subjected to abnormal physical or electrical stress, misuse, negligence, or accident, (f) the serial number on the Product has been altered, defaced, or removed, or (g) the product is supplied or licensed for beta, evaluation, testing or demonstration purposes for which Linksys does not charge a purchase price or license fee.

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TO THE EXTENT NOT PROHIBITED BY LAW, IN NO EVENT WILL LINKSYS BE LIABLE FOR ANY LOST DATA, REVENUE OR PROFIT, OR FOR SPECIAL, INDIRECT, CONSEQUENTIAL, INCIDENTAL OR PUNITIVE DAMAGES, REGARDLESS OF THE THEORY OF LIABILITY (INCLUDING NEGLIGENCE), ARISING OUT OF OR RELATED TO THE USE OF OR INABILITY TO USE THE PRODUCT (INCLUDING ANY SOFTWARE), EVEN IF LINKSYS HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. IN NO EVENT WILL LINKSYS' LIABILITY EXCEED THE AMOUNT PAID BY YOU FOR THE PRODUCT. The foregoing limitations will apply even if any warranty or remedy provided under this limited warranty fails of its essential purpose. Some jurisdictions do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

Obtaining Warranty Service

If you have a question about your product or experience a problem with it, please go to **www.linksys.com/support** where you will find a variety of online support tools and information to assist you with your product. If the product proves defective during the Warranty Period, contact the Value Added Reseller (VAR) from whom you purchased the product or Linksys Technical Support for instructions on how to obtain warranty service. The telephone number for Linksys Technical Support in your area can be found in the product User Guide and at **www.linksys.com**. Have your product serial number and proof of purchase on hand when calling. A DATED PROOF OF ORIGINAL PURCHASE IS REQUIRED TO PROCESS WARRANTY CLAIMS. If you are requested to return your product, you will be given a Return Materials Authorization (RMA) number. You are responsible for properly packaging and shipping your product to Linksys at your cost and risk. You must include the RMA number and a copy of your dated proof of original purchase when returning your product. Products received without a RMA number and dated proof of original purchase will be rejected. Do not include any other items with the product you are returning to Linksys. Defective product covered by this limited warranty will be repaired or replaced and returned to you without charge. Customers outside of the United States of America and Canada are responsible for all shipping and handling charges, custom duties, VAT and other associated taxes and charges. Repairs or replacements not covered under this limited warranty will be subject to charge at Linksys' then-current rates.

Technical Support

This limited warranty is neither a service nor a support contract. Information about Linksys' current technical support offerings and policies (including any fees for support services) can be found at:
www.linksys.com/support.

This limited warranty is governed by the laws of the jurisdiction in which the Product was purchased by you.

Please direct all inquiries to: Linksys, P.O. Box 18558, Irvine, CA 92623.

Appendix J: Software License Agreement

Software in Linksys Products:

This product from Cisco-Linksys LLC or from one of its affiliates Cisco Systems-Linksys (Asia) Pte Ltd. or Cisco-Linksys K.K. ("Linksys") contains software (including firmware) originating from Linksys and its suppliers and may also contain software from the open source community. Any software originating from Linksys and its suppliers is licensed under the Linksys Software License Agreement contained at Schedule 1 below. You may also be prompted to review and accept that Linksys Software License Agreement upon installation of the software.

Any software from the open source community is licensed under the specific license terms applicable to that software made available by Linksys at **www.linksys.com/gpl** or as provided for in Schedules 2 and 3 below.

Where such specific license terms entitle you to the source code of such software, that source code is upon request available at cost from Linksys for at least three years from the purchase date of this product and may also be available for download from **www.linksys.com/gpl**. For detailed license terms and additional information on open source software in Linksys products please look at the Linksys public web site at: **www.linksys.com/gpl/** or Schedule 2 below as applicable.

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Version 2, June 1991

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END OF SCHEDULE 3

Appendix K: Regulatory Information

FCC Statement

This product has been tested and complies with the specifications for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used according to the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which is found by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment or devices
- Connect the equipment to an outlet other than the receiver's
- Consult a dealer or an experienced radio/TV technician for assistance

Safety Notices

- Caution: To reduce the risk of fire, use only No.26 AWG or larger telecommunication line cord.
- Do not use this product near water, for example, in a wet basement or near a swimming pool.
- Avoid using this product during an electrical storm. There may be a remote risk of electric shock from lightning.

⚠ **WARNING:** This product contains lead, known to the State of California to cause cancer, and birth defects or other reproductive harm. Wash hands after handling.

Industry Canada Statement

This Class B digital apparatus complies with Canadian ICES-003.

Operation is subject to the following two conditions:

1. This device may not cause interference and
2. This device must accept any interference, including interference that may cause undesired operation of the device.

Avis d'Industrie Canada

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

Le fonctionnement est soumis aux conditions suivantes :

1. Ce périphérique ne doit pas causer d'interférences;
2. Ce périphérique doit accepter toutes les interférences reçues, y compris celles qui risquent d'entraîner un fonctionnement indésirable.

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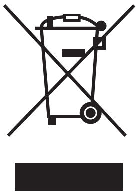

English - Environmental Information for Customers in the European Union

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EU-direktiv 2002/96/EF kræver, at udstyr der bærer dette symbol 🗑 på produktet og/eller emballagen ikke må bortskaffes som usorteret kommunalt affald. Symbolet betyder, at dette produkt skal bortskaffes adskilt fra det almindelige husholdningsaffald. Det er dit ansvar at bortskaffe dette og andet elektrisk og elektronisk udstyr via bestemte indsamlingssteder udpeget af staten eller de lokale myndigheder. Korrekt bortskaffelse og genvinding vil hjælpe med til at undgå mulige skader for miljøet og menneskers sundhed. Kontakt venligst de lokale myndigheder, renovationstjenesten eller den butik, hvor du har købt produktet, angående mere detaljeret information om bortskaffelse af dit gamle udstyr.

Deutsch (German) - Umweltinformation für Kunden innerhalb der Europäischen Union

Die Europäische Richtlinie 2002/96/EC verlangt, dass technische Ausrüstung, die direkt am Gerät und/oder an der Verpackung mit diesem Symbol versehen ist 🗑, nicht zusammen mit unsortiertem Gemeindeabfall entsorgt werden darf. Das Symbol weist darauf hin, dass das Produkt von regulärem Haushaltmüll getrennt entsorgt werden sollte. Es liegt in Ihrer Verantwortung, dieses Gerät und andere elektrische und elektronische Geräte über die dafür zuständigen und von der Regierung oder örtlichen Behörden dazu bestimmten Sammelstellen zu entsorgen. Ordnungsgemäßes Entsorgen und Recyceln trägt dazu bei, potentielle negative Folgen für Umwelt und die menschliche Gesundheit zu vermeiden. Wenn Sie weitere Informationen zur Entsorgung Ihrer Altgeräte benötigen, wenden Sie sich bitte an die örtlichen Behörden oder städtischen Entsorgungsdienste oder an den Händler, bei dem Sie das Produkt erworben haben.

Eesti (Estonian) - Keskkonnaalane informatsioon Euroopa Liidus asuvatele klientidele

Euroopa Liidu direktiivi 2002/96/EÜ nõuete kohaselt on seadmeid, millel on tootel või pakendil käesolev sümbol 🗑, keelatud kõrvaldada koos sorteerimata olmejäätmetega. See sümbol näitab, et toode tuleks kõrvaldada eraldi tavalistest olmejäätmevoogudest. Olete kohustatud kõrvaldama käesoleva ja ka muud elektri- ja elektroonikaseadmed riigi või kohalike ametiasutuste poolt ette nähtud kogumispunktide kaudu. Seadmete korrektne kõrvaldamine ja ringlussevõtt aitab vältida võimalikke negatiivseid tagajärgi keskkonnale ning inimeste tervisele. Vanade seadmete kõrvaldamise kohta täpsema informatsiooni saamiseks võtke palun ühendust kohalike ametiasutustega, jäätmekäitlusfirmaga või kauplusega, kust te toote ostsite.

Español (Spanish) - Información medioambiental para clientes de la Unión Europea

La Directiva 2002/96/CE de la UE exige que los equipos que lleven este símbolo 🗑 en el propio aparato y/o en su embalaje no deben eliminarse junto con otros residuos urbanos no seleccionados. El símbolo indica que el producto en cuestión debe separarse de los residuos domésticos convencionales con vistas a su eliminación. Es responsabilidad suya desechar este y cualesquiera otros aparatos eléctricos y electrónicos a través de los puntos de recogida que ponen a su disposición el gobierno y las autoridades locales. Al desechar y reciclar correctamente estos aparatos estará contribuyendo a evitar posibles consecuencias negativas para el medio ambiente y la salud de las personas. Si desea obtener información más detallada sobre la eliminación segura de su aparato usado, consulte a las autoridades locales, al servicio de recogida y eliminación de residuos de su zona o pregunte en la tienda donde adquirió el producto.

ξλληνικά (Greek) - Στοιχεία περιβαλλοντικής προστασίας για πελάτες εντός της Ευρωπαϊκής Ένωσης

Η Κοινοτική Οδηγία 2002/96/EC απαιτεί ότι ο εξοπλισμός ο οποίος φέρει αυτό το σύμβολο 🗑 στο προϊόν και/ή στη συσκευασία του δεν πρέπει να απορρίπτεται μαζί με τα μικτά κοινοτικά απορρίμματα. Το σύμβολο υποδεικνύει ότι αυτό το προϊόν θα πρέπει να απορρίπτεται ξεχωριστά από τα συνήθη οικιακά απορρίμματα. Είστε υπεύθυνος για την απόρριψη του παρόντος και άλλου ηλεκτρικού και ηλεκτρονικού εξοπλισμού μέσω των καθορισμένων εγκαταστάσεων συγκέντρωσης απορριμμάτων οι οποίες παρέχονται από το κράτος ή τις αρμόδιες τοπικές αρχές. Η σωστή απόρριψη και ανακύκλωση συμβάλλει στην πρόληψη πιθανών αρνητικών συνεπειών για το περιβάλλον και την υγεία. Για περισσότερες πληροφορίες σχετικά με την απόρριψη του παλιού σας εξοπλισμού, παρακαλώ επικοινωνήστε με τις τοπικές αρχές, τις υπηρεσίες απόρριψης ή το κατάστημα από το οποίο αγοράσατε το προϊόν.

Français (French) - Informations environnementales pour les clients de l'Union européenne

La directive européenne 2002/96/CE exige que l'équipement sur lequel est apposé ce symbole 🗑 sur le produit et/ou son emballage ne soit pas jeté avec les autres ordures ménagères. Ce symbole indique que le produit doit être éliminé dans un circuit distinct de celui pour les déchets des ménages. Il est de votre responsabilité de jeter ce matériel ainsi que tout autre matériel électrique ou électronique par les moyens de collecte indiqués par le gouvernement et les pouvoirs publics des collectivités territoriales. L'élimination et le recyclage en bonne et due forme ont pour but de lutter contre l'impact néfaste potentiel de ce type de produits sur l'environnement et la santé publique. Pour plus d'informations sur le mode d'élimination de votre ancien équipement, veuillez prendre contact avec les pouvoirs publics locaux, le service de traitement des déchets, ou l'endroit où vous avez acheté le produit.

Italiano (Italian) - Informazioni relative all'ambiente per i clienti residenti nell'Unione Europea

La direttiva europea 2002/96/EC richiede che le apparecchiature contrassegnate con questo simbolo 🗑 sul prodotto e/o sull'imballaggio non siano smaltite insieme ai rifiuti urbani non differenziati. Il simbolo indica che questo prodotto non deve essere smaltito insieme ai normali rifiuti domestici. È responsabilità del proprietario smaltire sia questi prodotti sia le altre apparecchiature elettriche ed elettroniche mediante le specifiche strutture di raccolta indicate dal governo o dagli enti pubblici locali. Il corretto smaltimento ed il riciclaggio aiuteranno a prevenire conseguenze potenzialmente negative per l'ambiente e per la salute dell'essere umano. Per ricevere informazioni più dettagliate circa lo smaltimento delle vecchie apparecchiature in Vostro possesso, Vi invitiamo a contattare gli enti pubblici di competenza, il servizio di smaltimento rifiuti o il negozio nel quale avete acquistato il prodotto.

Latviešu valoda (Latvian) - Ekoloģiska informācija klientiem Eiropas Savienības jurisdikcijā

Direktīvā 2002/96/EK ir prasība, ka aprīkojumu, kam pievienota zīme 🗑 uz paša izstrādājuma vai uz tā iesaiņojuma, nedrīkst izmest nešķirotā veidā kopā ar komunālajiem atkritumiem (tiem, ko rada vietēji iedzīvotāji un uzņēmumi). Šī zīme nozīmē to, ka šī ierīce ir jāizmet atkritumos tā, lai tā nenonāktu kopā ar parastiem mājsaimniecības atkritumiem. Jūsu pienākums ir šo un citas elektriskas un elektroniskas ierīces izmest atkritumos, izmantojot īpašus atkritumu savākšanas veidus un līdzekļus, ko nodrošina valsts un pašvaldību iestādes. Ja izmešana atkritumos un pārstrāde tiek veikta pareizi, tad mazinās iespējamais kaitējums dabai un cilvēku veselībai. Sīkākas ziņas par novecojuša aprīkojuma izmešanu atkritumos jūs varat saņemt vietējā pašvaldībā, atkritumu savākšanas dienestā, kā arī veikalā, kur iegādājāties šo izstrādājumu.

Lietuvškai (Lithuanian) - Aplinkosaugos informacija, skirta Europos Sąjungos vartotojams

Europos direktyva 2002/96/EC numato, kad įrangos, kuri ir 🗑 kurios pakuotė yra pažymėta šiuo simboliu (įveskite simbolį), negalima šalinti kartu su nerūšiuotomis komunalinėmis atliekomis. Šis simbolis rodo, kad gaminį reikia šalinti atskirai nuo bendro buitinių atliekų srauto. Jūs privalote užtikrinti, kad ši ir kita elektros ar elektroninė įranga būtų šalinama per tam tikras nacionalinės ar vietinės valdžios nustatytas atliekų rinkimo sistemas. Tinkamai šalinant ir perdirbant atliekas, bus išvengta galimos žalos aplinkai ir žmonių sveikatai. Daugiau informacijos apie jūsų senos įrangos šalinimą gali pateikti vietinės valdžios institucijos, atliekų šalinimo tarnybos arba parduotuvės, kuriose įsigijote tą gaminį.

Malti (Maltese) - Informazzjoni Ambjentali għal Klijenti fl-Unjoni Ewropea

Id-Direttiva Ewropea 2002/96/KE titlob li t-tagħmir li jkun fih is-simbolu 🗑 fuq il-prodott u/jew fuq l-ippakkjar ma jistax jintrema ma' skart muniċipali li ma ġiex isseparat. Is-simbolu jindika li dan il-prodott għandu jintrema separatament minn ma' l-iskart domestiku regolari. Hija responsabbiltà tiegħek li tarmi dan it-tagħmir u kull tagħmir ieħor ta' l-elettriku u elettroniku permezz ta' faċilitajiet ta' ġbir appuntati apposta mill-gvern jew mill-awtoritajiet lokali. Ir-rimi b'mod korrett u r-riċiklaġġ jgħin jipprevjeni konsegwenzi negattivi potenzjali għall-ambjent u għas-saħħa tal-bniedem. Għal aktar informazzjoni dettaljata dwar ir-rimi tat-tagħmir antik tiegħek, jekk jogħġbok ikkuntattja lill-awtoritajiet lokali tiegħek, is-servizzi għar-rimi ta' l-iskart, jew il-ħanut minn fejn xtrajt il-prodott.

Magyar (Hungarian) - Környezetvédelmi információ az európai uniós vásárlók számára

A 2002/96/EC számú európai uniós irányelv megkívánja, hogy azokat a termékeket, amelyeken, és/vagy amelyek csomagolásán az alábbi címke 🗑 megjelenik, tilos a többi szelektálatlan lakossági hulladékkal együtt kidobni. A címke azt jelöli, hogy az adott termék kidobásakor a szokványos háztartási hulladékelszállítási rendszerektõl elkülönített eljárást kell alkalmazni. Az Ön felelõssége, hogy ezt, és más elektromos és elektronikus berendezéseit a kormányzati vagy a helyi hatóságok által kijelölt gyűjtõredszereken keresztül számolja fel. A megfelelõ hulladékfeldolgozás segít a környezetre és az emberi egészségre potenciálisan ártalmas negatív hatások megelõzésében. Ha elavult berendezéseinek felszámolásához további részletes információra van szüksége, kérjük, lépjen kapcsolatba a helyi hatóságokkal, a hulladékfeldolgozási szolgálattal, vagy azzal üzlettel, ahol a terméket vásárolta.

Nederlands (Dutch) - Milieu-informatie voor klanten in de Europese Unie

De Europese Richtlijn 2002/96/EC schrijft voor dat apparatuur die is voorzien van dit symbool 🗑 op het product of de verpakking, niet mag worden ingezameld met niet-gescheiden huishoudelijk afval. Dit symbool geeft aan dat het product apart moet worden ingezameld. U bent zelf verantwoordelijk voor de vernietiging van deze en andere elektrische en elektronische apparatuur via de daarvoor door de landelijke of plaatselijke overheid aangewezen inzamelingskanalen. De juiste vernietiging en recycling van deze apparatuur voorkomt mogelijke negatieve gevolgen voor het milieu en de gezondheid. Voor meer informatie over het vernietigen van uw oude apparatuur neemt u contact op met de plaatselijke autoriteiten of afvalverwerkingsdienst, of met de winkel waar u het product hebt aangeschaft.

Norsk (Norwegian) - Miljøinformasjon for kunder i EU

EU-direktiv 2002/96/EF krever at utstyr med følgende symbol 🗑 avbildet på produktet og/eller pakningen, ikke må kastes sammen med usortert avfall. Symbolet indikerer at dette produktet skal håndteres atskilt fra ordinær avfallsinnsamling for husholdningsavfall. Det er ditt ansvar å kvitte deg med dette produktet og annet elektrisk og elektronisk avfall via egne innsamlingsordninger slik myndighetene eller kommunene bestemmer. Korrekt avfallshåndtering og gjenvinning vil være med på å forhindre mulige negative konsekvenser for miljø og helse. For nærmere informasjon om håndtering av det kasserte utstyret ditt, kan du ta kontakt med kommunen, en innsamlingsstasjon for avfall eller butikken der du kjøpte produktet.

Polski (Polish) - Informacja dla klientów w Unii Europejskiej o przepisach dotyczących ochrony środowiska

Dyrektywa Europejska 2002/96/EC wymaga, aby sprzęt oznaczony symbolem 🗑 znajdującym się na produkcie i/lub jego opakowaniu nie był wyrzucany razem z innymi niesortowanymi odpadami komunalnymi. Symbol ten wskazuje, że produkt nie powinien być usuwany razem ze zwykłymi odpadami z gospodarstw domowych. Na Państwu spoczywa obowiązek wyrzucania tego i innych urządzeń elektrycznych oraz elektronicznych w punktach odbioru wyznaczonych przez władze krajowe lub lokalne. Pozbywanie się sprzętu we właściwy sposób i jego recykling pomogą zapobiec potencjalnie negatywnym konsekwencjom dla środowiska i zdrowia ludzkiego. W celu uzyskania szczegółowych informacji o usuwaniu starego sprzętu, prosimy zwrócić się do lokalnych władz, służb oczyszczania miasta lub sklepu, w którym produkt został nabyty.

Português (Portuguese) - Informação ambiental para clientes da União Europeia

A Directiva Europeia 2002/96/CE exige que o equipamento que exibe este símbolo 🗑 no produto e/ou na sua embalagem não seja eliminado junto com os resíduos municipais não separados. O símbolo indica que este produto deve ser eliminado separadamente dos resíduos domésticos regulares. É da sua responsabilidade eliminar este e qualquer outro equipamento eléctrico e electrónico através das instalações de recolha designadas pelas autoridades governamentais ou locais. A eliminação e reciclagem correctas ajudarão a prevenir as consequências negativas para o ambiente e para a saúde humana. Para obter informações mais detalhadas sobre a forma de eliminar o seu equipamento antigo, contacte as autoridades locais, os serviços de eliminação de resíduos ou o estabelecimento comercial onde adquiriu o produto.

Română (Romanian) - Informaţii de mediu pentru clienţii din Uniunea Europeană

Directiva europeană 2002/96/CE impune ca echipamentele care prezintă acest simbol 🗑 pe produs şi/sau pe ambalajul acestuia să nu fie casate împreună cu gunoiul menajer municipal. Simbolul indică faptul că acest produs trebuie să fie casat separat de gunoiul menajer obişnuit. Este responsabilitatea dvs. să casaţi acest produs şi alte echipamente electrice şi electronice prin intermediul unităţilor de colectare special desemnate de guvern sau de autorităţile locale. Casarea şi reciclarea corecte vor ajuta la prevenirea potenţialelor consecinţe negative asupra sănătăţii mediului şi a oamenilor. Pentru mai multe informaţii detaliate cu privire la casarea acestui echipament vechi, contactaţi autorităţile locale, serviciul de salubrizare sau magazinul de la care aţi achiziţionat produsul.

Slovenčina (Slovak) - Informácie o ochrane životného prostredia pre zákazníkov v Európskej únii

Podľa európskej smernice 2002/96/ES zariadenie s týmto symbolom 🗑 na produkte a/alebo jeho balení nesmie byť likvidované spolu s netriedeným komunálnym odpadom. Symbol znamená, že produkt by sa mal likvidovať oddelene od bežného odpadu z domácností. Je vašou povinnosťou likvidovať toto i ostatné elektrické a elektronické zariadenia prostredníctvom špecializovaných zberných zariadení určených vládou alebo miestnymi orgánmi. Správna likvidácia a recyklácia pomôže zabrániť prípadným negatívnym dopadom na životné prostredie a zdravie ľudí. Ak máte záujem o podrobnejšie informácie o likvidácii starého zariadenia, obráťte sa, prosím, na miestne orgány, organizácie zaoberajúce sa likvidáciou odpadov alebo obchod, v ktorom ste si produkt zakúpili.

Slovenčina (Slovene) - Okoljske informacije za stranke v Evropski uniji

Evropska direktiva 2002/96/EC prepoveduje odlaganje opreme, označene s tem simbolom 🗑 – na izdelku in/ali na embalaži – med običajne, nerazvrščene odpadke. Ta simbol opozarja, da je treba izdelek odvreči ločeno od preostalih gospodinjskih odpadkov. Vaša odgovornost je, da to in preostalo električno in elektronsko opremo odnesete na posebna zbirališča, ki jih določijo državne ustanove ali lokalna uprava. S pravilnim odlaganjem in recikliranjem boste preprečili morebitne škodljive vplive na okolje in zdravje ljudi. Če želite izvedeti več o odlaganju stare opreme, se obrnite na lokalno upravo, odpad ali trgovino, kjer ste izdelek kupili.

Suomi (Finnish) - Ympäristöä koskevia tietoja EU-alueen asiakkaille

EU-direktiivi 2002/96/EY edellyttää, että jos laitteistossa on tämä symboli 🗑 itse tuotteessa ja/tai sen pakkauksessa, laitteistoa ei saa hävittää lajittelemattoman yhdyskuntajätteen mukana. Symboli merkitsee sitä, että tämä tuote on hävitettävä erillään tavallisesta kotitalousjätteestä. Sinun vastuullasi on hävittää tämä elektroniikkatuote ja muut vastaavat elektroniikkatuotteet viemällä tuote tai tuotteet viranomaisten määräämään keräyspisteeseen. Laitteiston oikea hävittäminen estää mahdolliset kielteiset vaikutukset ympäristöön ja ihmisten terveyteen. Lisätietoja vanhan laitteiston oikeasta hävitystavasta saa paikallisilta viranomaisilta, jätteenhävityspalvelusta tai siitä myymälästä, josta ostit tuotteen.

Svenska (Swedish) - Miljöinformation för kunder i Europeiska unionen

Det europeiska direktivet 2002/96/EC kräver att utrustning med denna symbol 🗑 på produkten och/eller förpackningen inte får kastas med osorterat kommunalt avfall. Symbolen visar att denna produkt bör kastas efter att den avskiljts från vanligt hushållsavfall. Det faller på ditt ansvar att kasta denna och annan elektrisk och elektronisk utrustning på fastställda insamlingsplatser utsedda av regeringen eller lokala myndigheter. Korrekt kassering och återvinning skyddar mot eventuella negativa konsekvenser för miljön och personhälsa. För mer detaljerad information om kassering av din gamla utrustning kontaktar du dina lokala myndigheter, avfallshanteringen eller butiken där du köpte produkten.

WEB: For additional information, please visit **www.linksys.com**

Appendix L:
Contact Information

Linksys Contact Information	
Website	http://www.linksys.com
Support Site	http://www.linksys.com/support
FTP Site	ftp.linksys.com
Advice Line	800-546-5797 (LINKSYS)
Support	800-326-7114
RMA (Return Merchandise Authorization)	http://www.linksys.com/warranty

✓ **NOTE:** Details on warranty and RMA issues can be found in the Warranty section of this Guide.

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